



US006497692B1

(12) **United States Patent**
Tameishi et al.

(10) **Patent No.:** **US 6,497,692 B1**
(45) **Date of Patent:** ***Dec. 24, 2002**

(54) **INDIVIDUALLY PACKAGED ABSORBENT ARTICLE**

6,063,065 A * 5/2000 Costa 206/438
6,074,376 A 6/2000 Mills

(75) Inventors: **Kazuaki Tameishi**, Hyogo (JP); **Nami Terada**, Kobe (JP)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **The Procter & Gamble Company**, Cincinnati, OH (US)

DE	196 06 902 A1	8/1997	
GB	2 306 428 A	5/1997	
WO	WO 98/42285 A1	10/1998	
WO	WO 00/19953	* 4/2000 A61F/13/15
WO	WO 00/19954	* 4/2000 A61F/13/15

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

* cited by examiner

This patent is subject to a terminal disclaimer.

Primary Examiner—John J. Calvert

Assistant Examiner—Angela Grayson

(74) *Attorney, Agent, or Firm*—Matthew P. Fitzpatrick; Ingrid N. Hickman

(21) Appl. No.: **09/787,447**

(22) PCT Filed: **Oct. 5, 1998**

(86) PCT No.: **PCT/US98/21024**

§ 371 (c)(1),
(2), (4) Date: **Mar. 19, 2001**

(87) PCT Pub. No.: **WO00/19954**

PCT Pub. Date: **Apr. 13, 2000**

(51) **Int. Cl.**⁷ **A61F 13/15**

(52) **U.S. Cl.** **604/385.02**; 604/385.01;
604/385.02; 604/387; 604/397

(58) **Field of Search** 604/385, 385.02,
604/385.01, 385.04, 387, 397

(56) **References Cited**

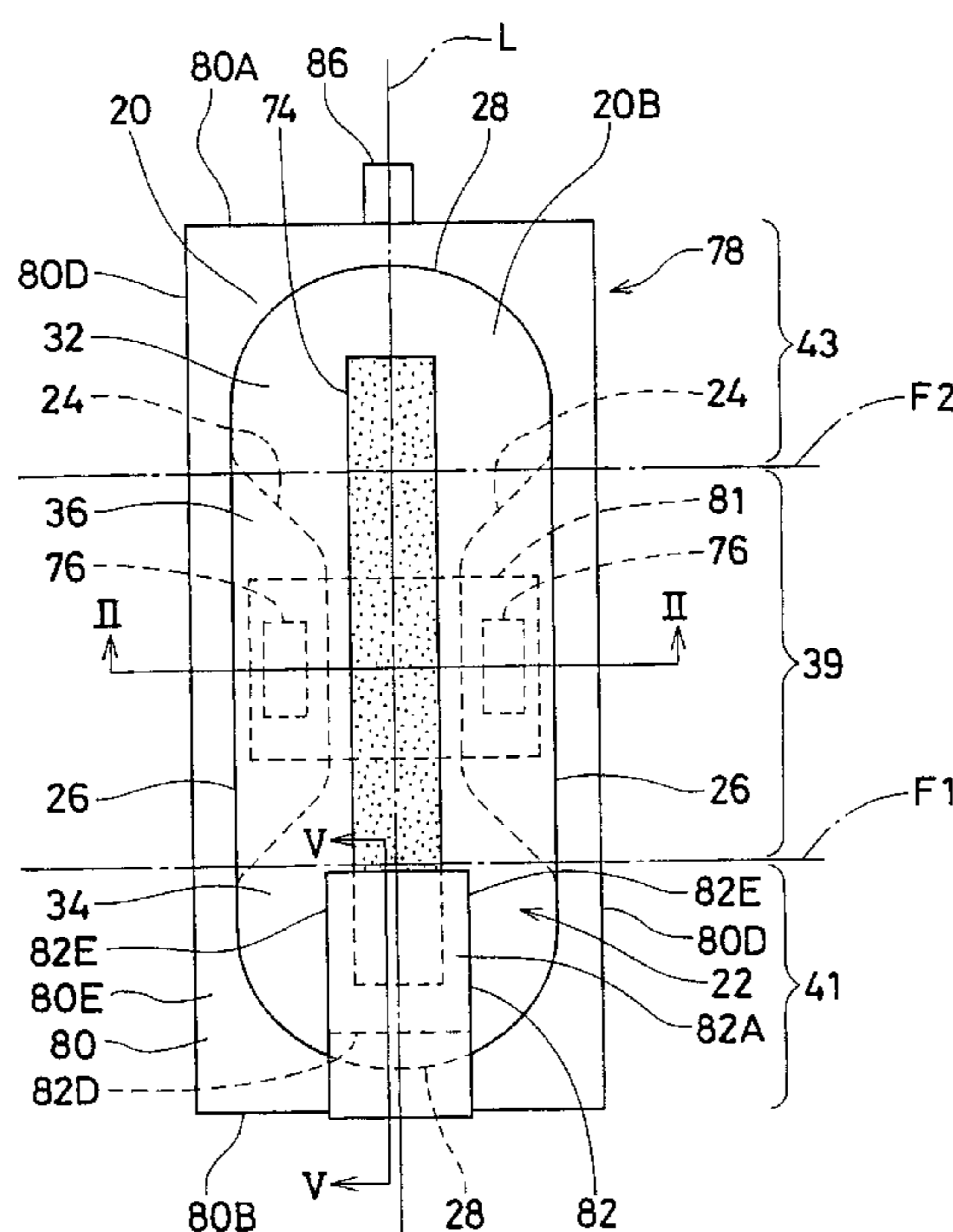
U.S. PATENT DOCUMENTS

5,413,568 A 5/1995 Roach et al.
5,569,230 A * 10/1996 Fisher et al. 206/438

(57) **ABSTRACT**

An individually packaged absorbent article is disclosed. The individually packaged absorbent article comprises an absorbent article and a wrapper. The absorbent article extends in a longitudinal direction and includes a main body portion having a pair of longitudinal side edges, a pair of end edges, a garment surface, and a body surface. The garment surface of the main body portion has a main fastener. The wrapper for the absorbent article has a main wrapper sheet and a main fastener cover. The body surface of the main body portion is disposed to face the main wrapper sheet. The main fastener of the main body portion is covered by the main fastener cover. The main fastener cover is joined to the main wrapper sheet. The main body portion and the wrapper are folded as a unit at least about one transverse axis such that the garment surface is oriented inwardly with respect to the folded unit. At least a part of the main fastener is exposed when the wrapper is opened.

10 Claims, 13 Drawing Sheets



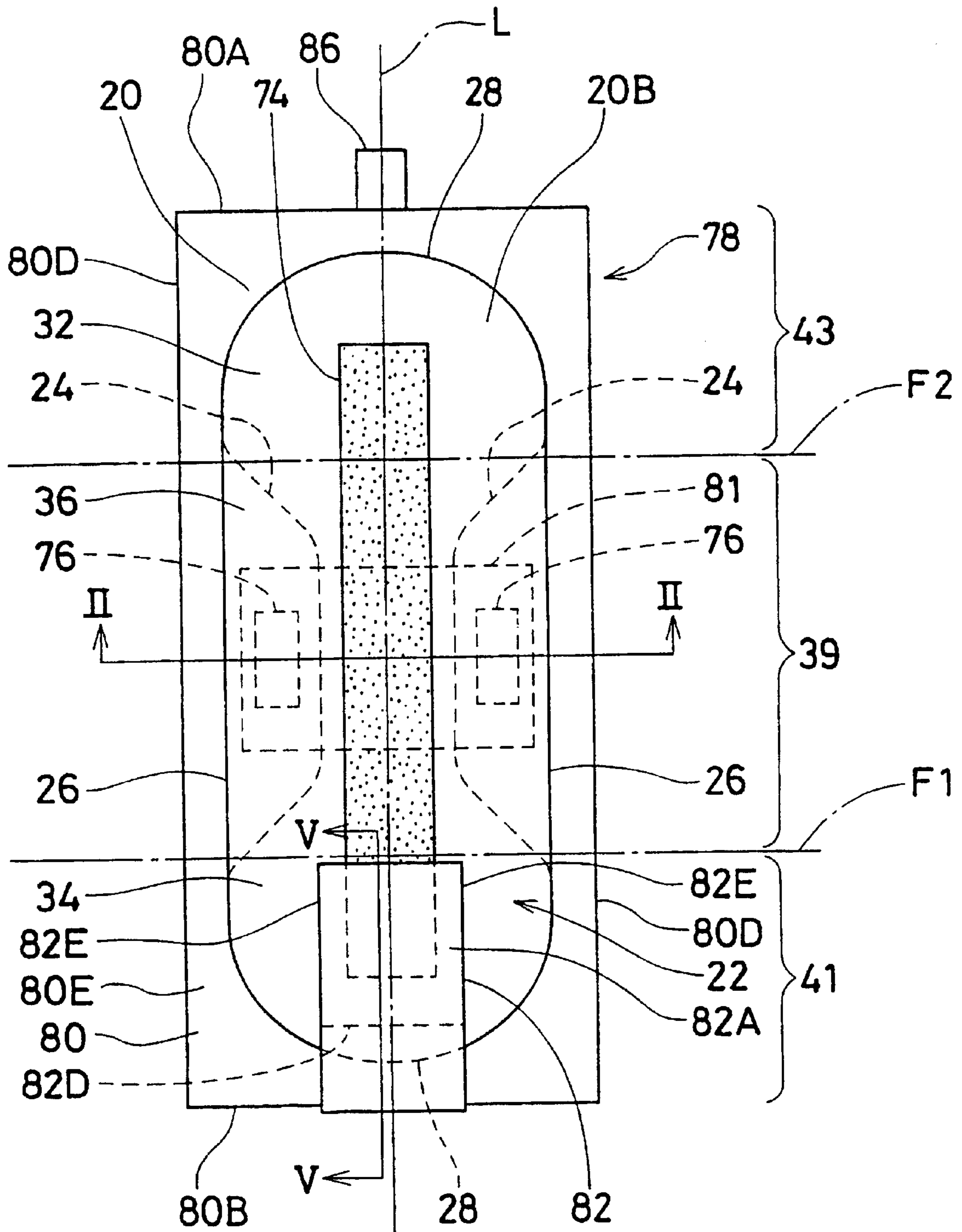


Fig. 1

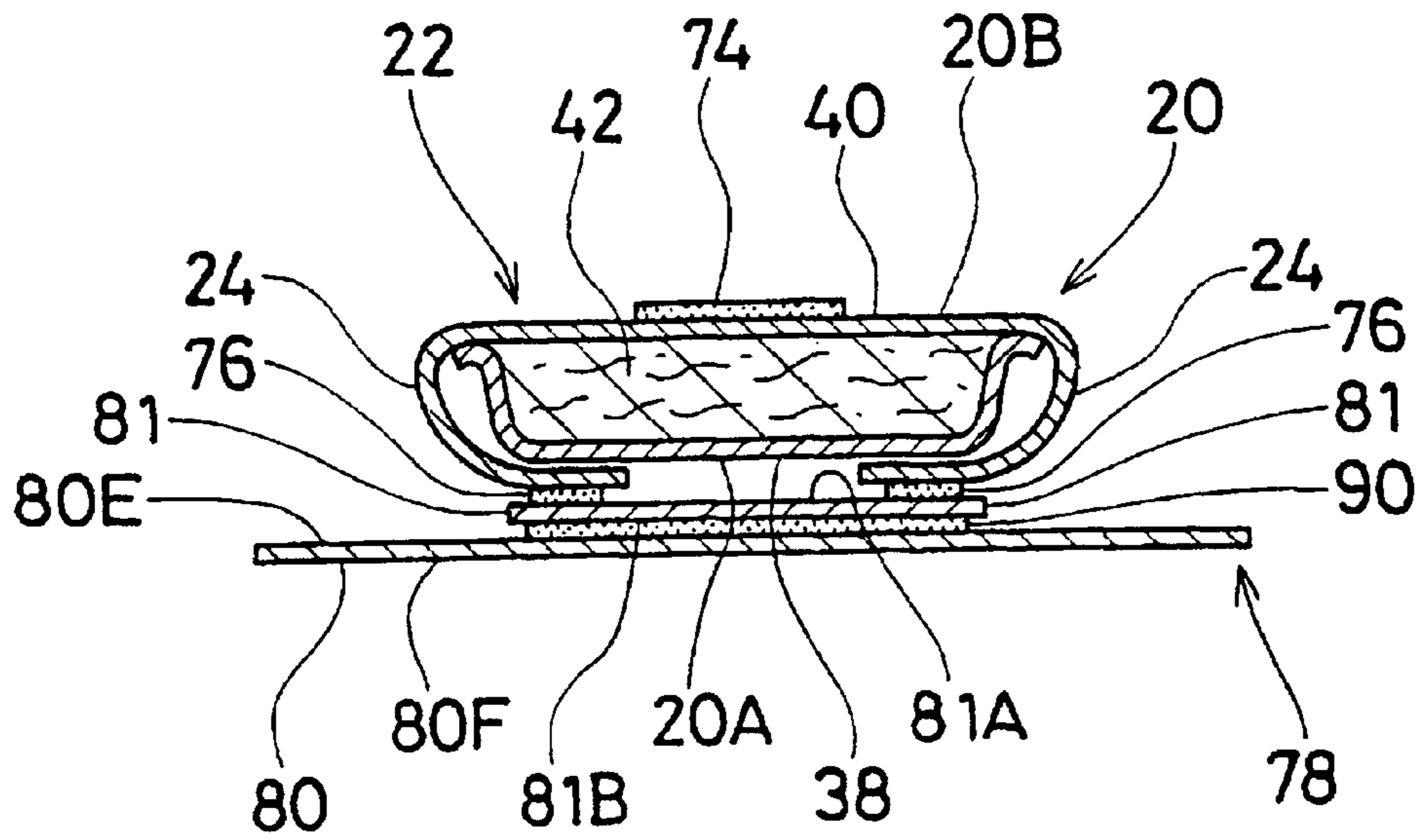


Fig. 2

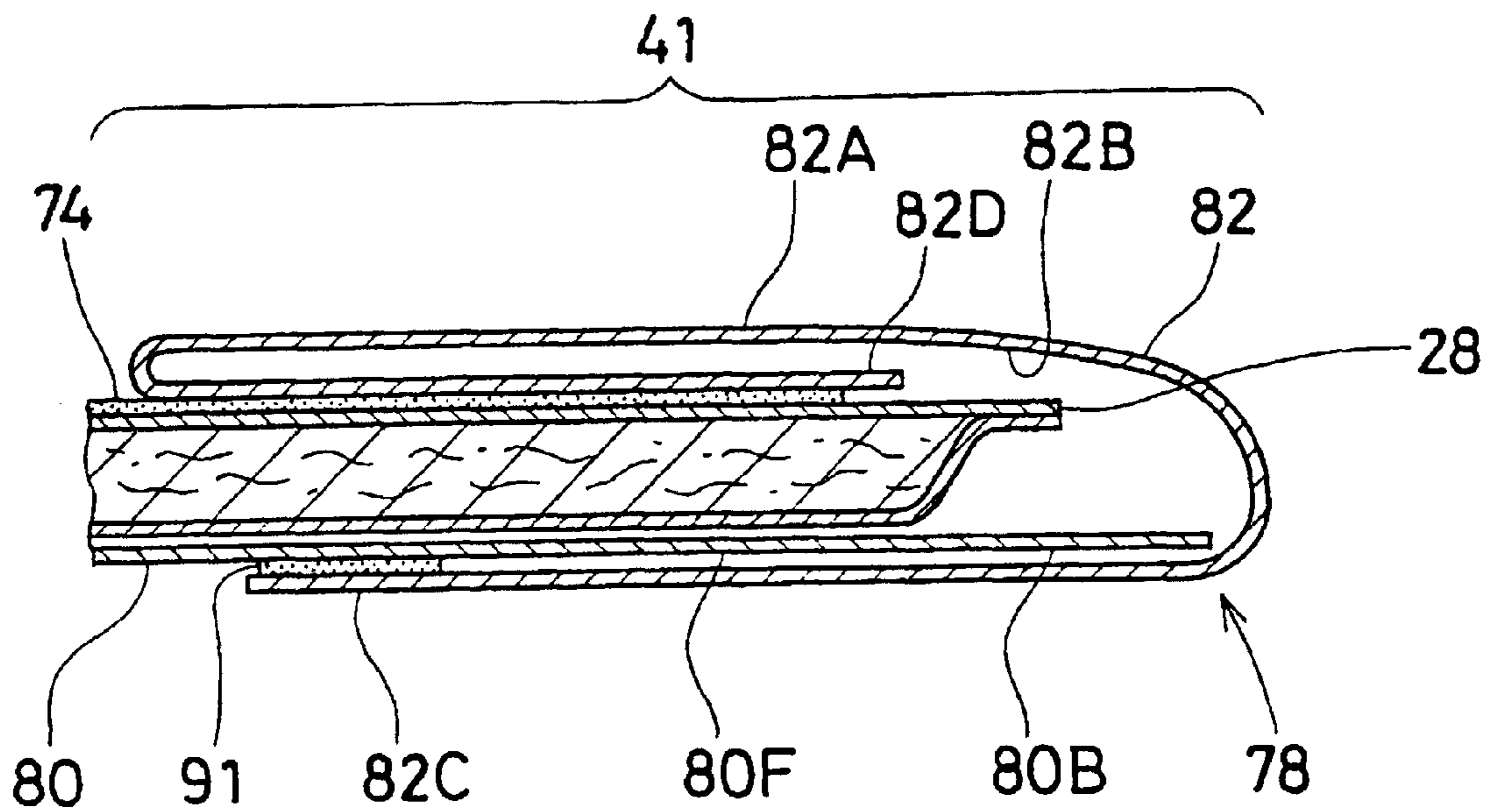


Fig. 5

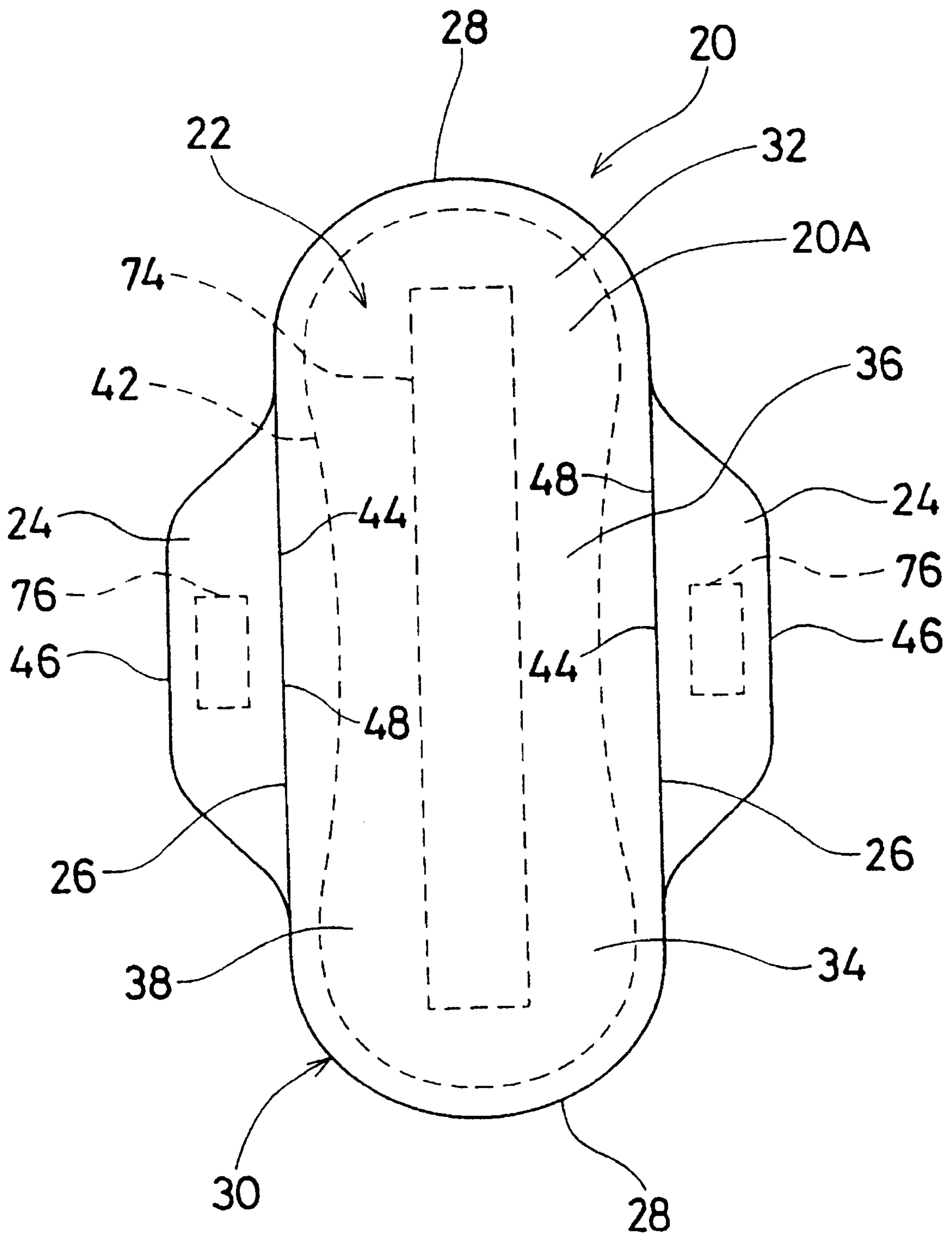


Fig. 3

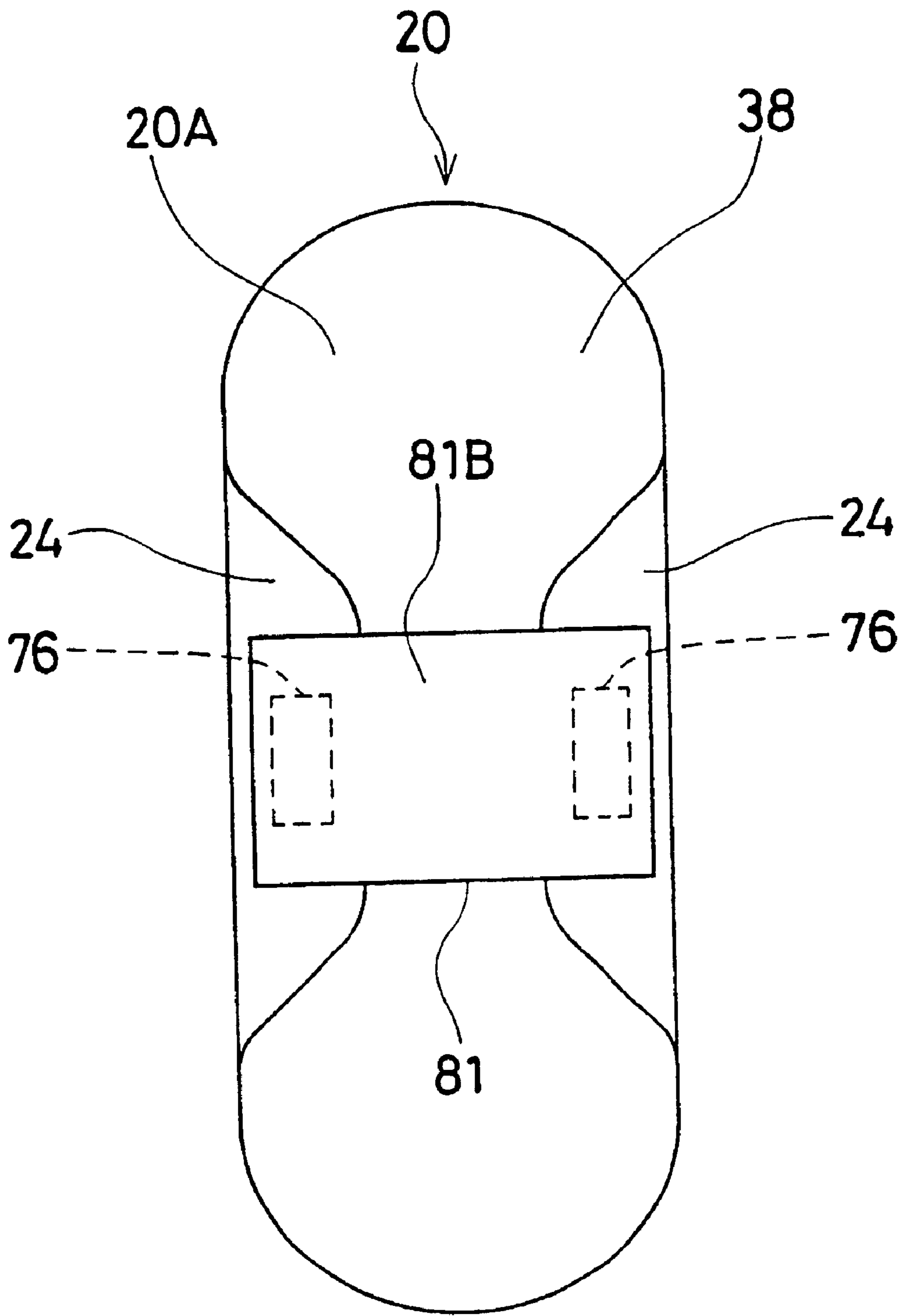


Fig. 4

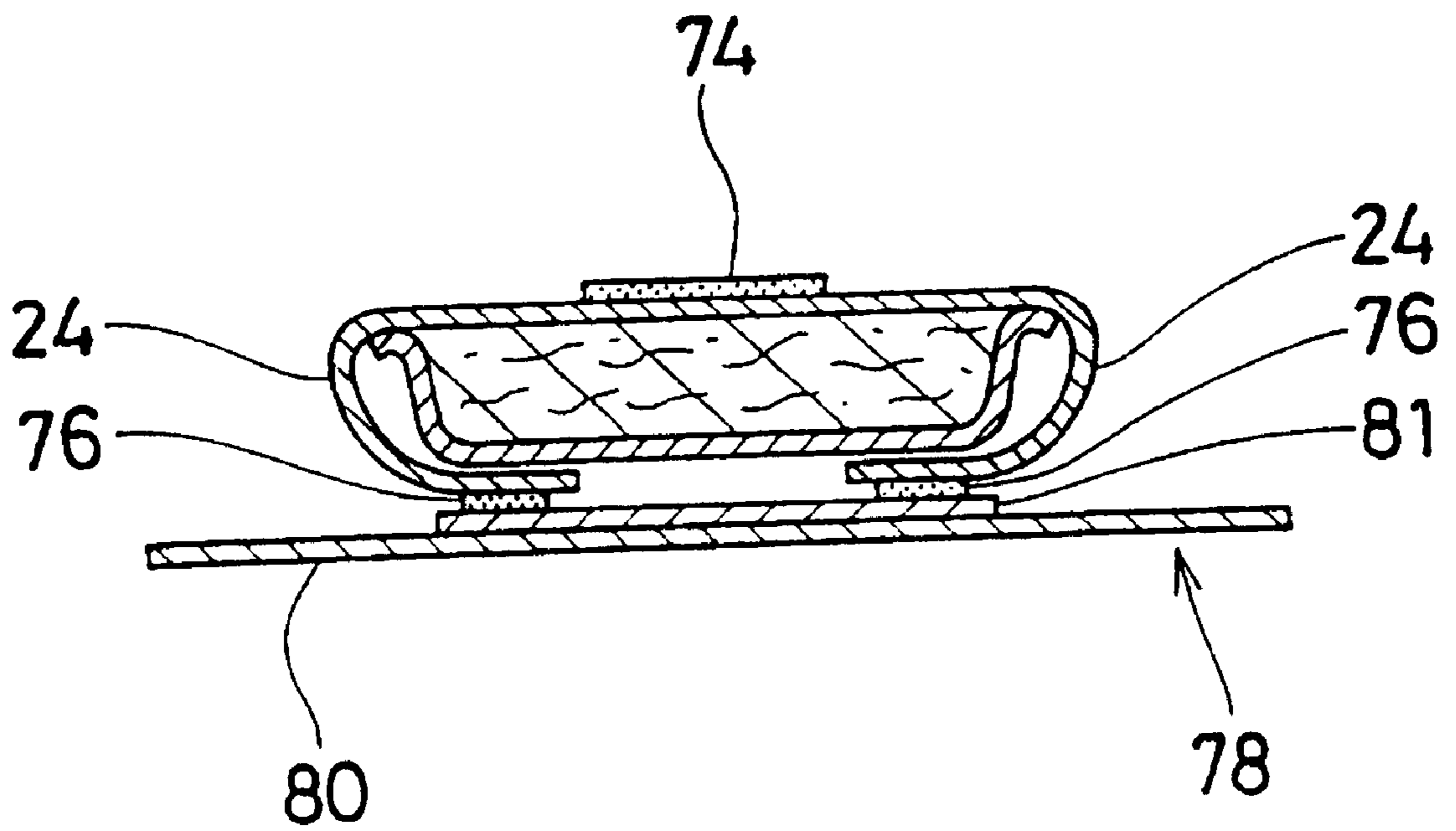


Fig. 6

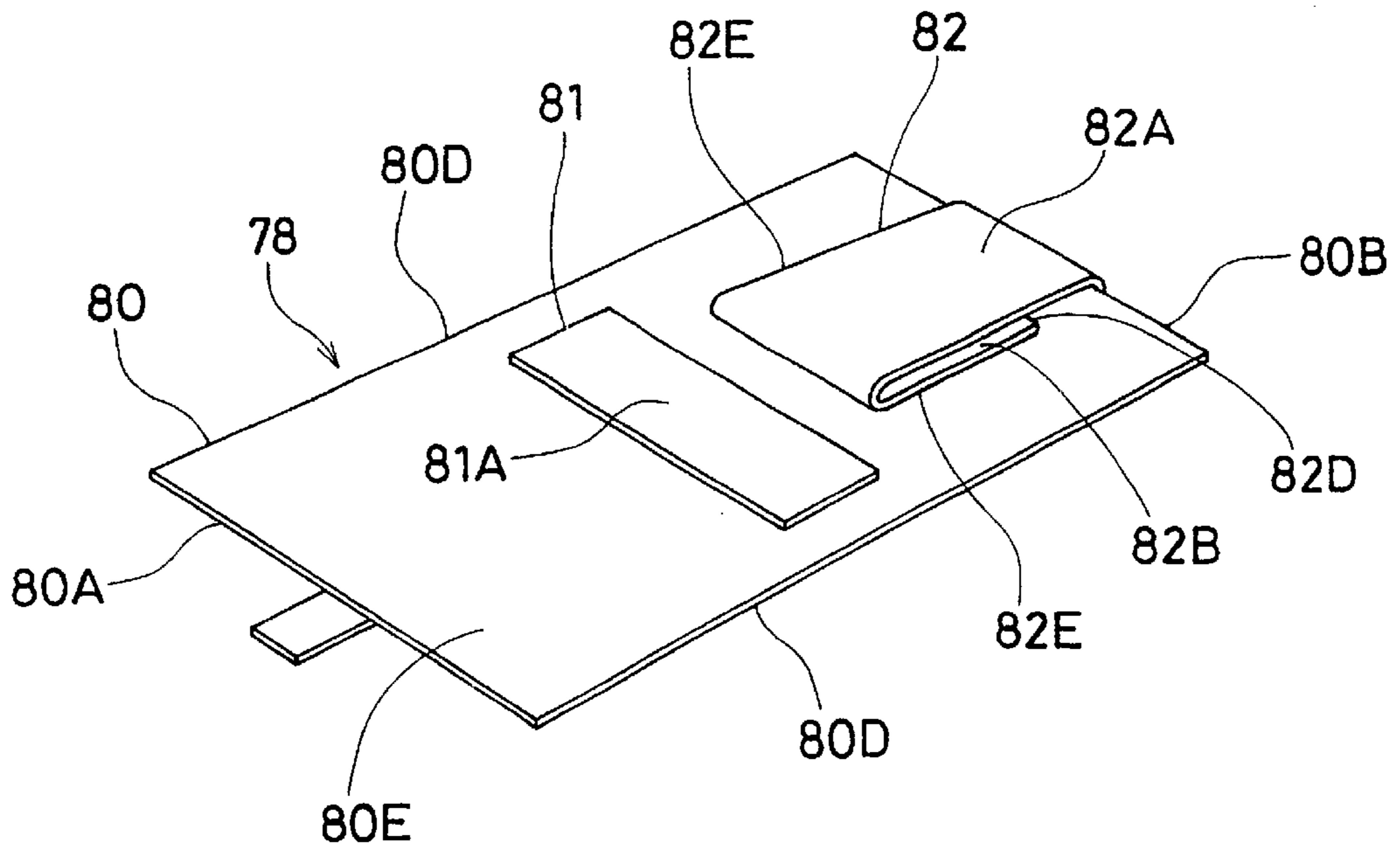


Fig. 7

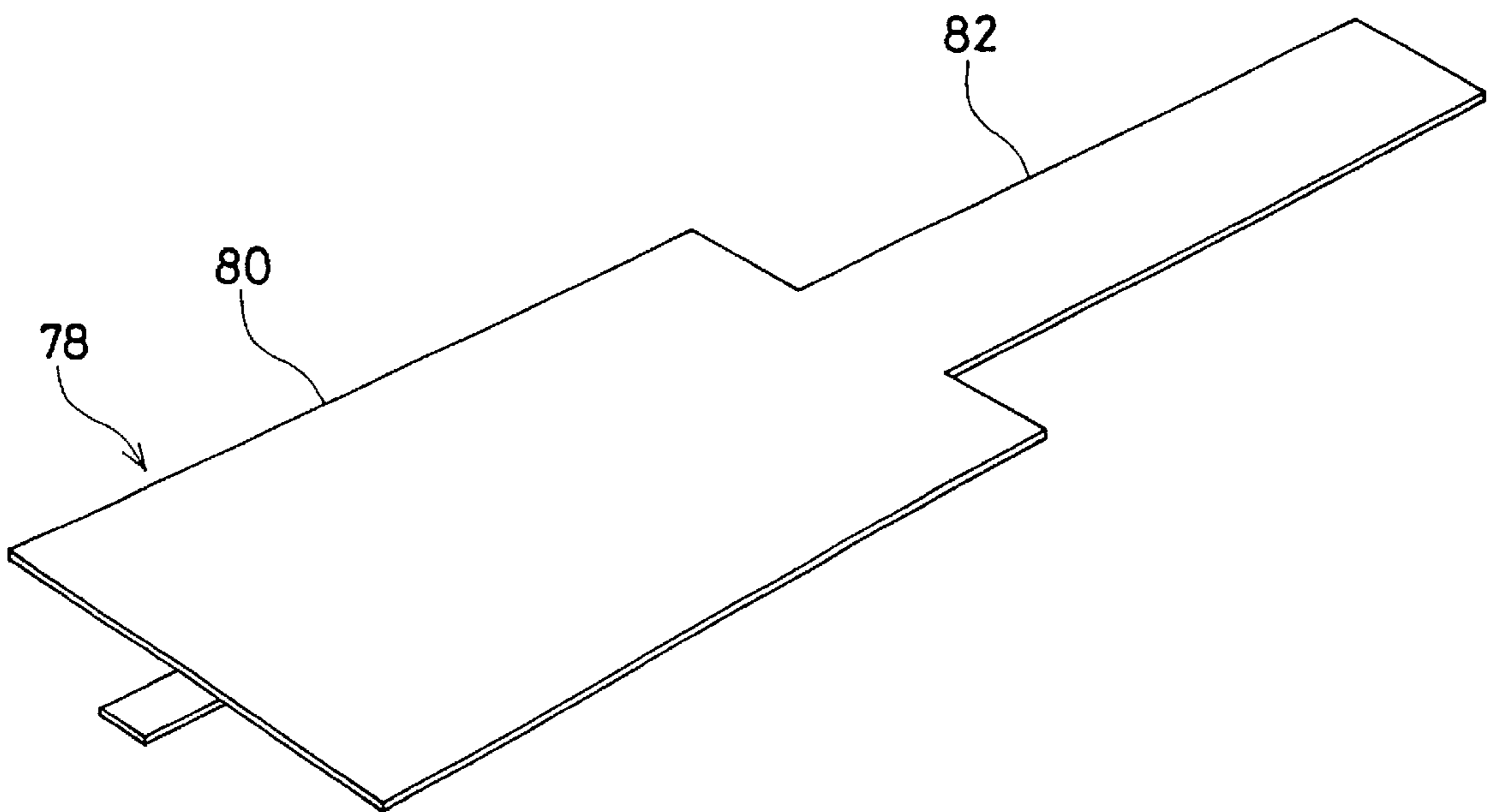


Fig. 8

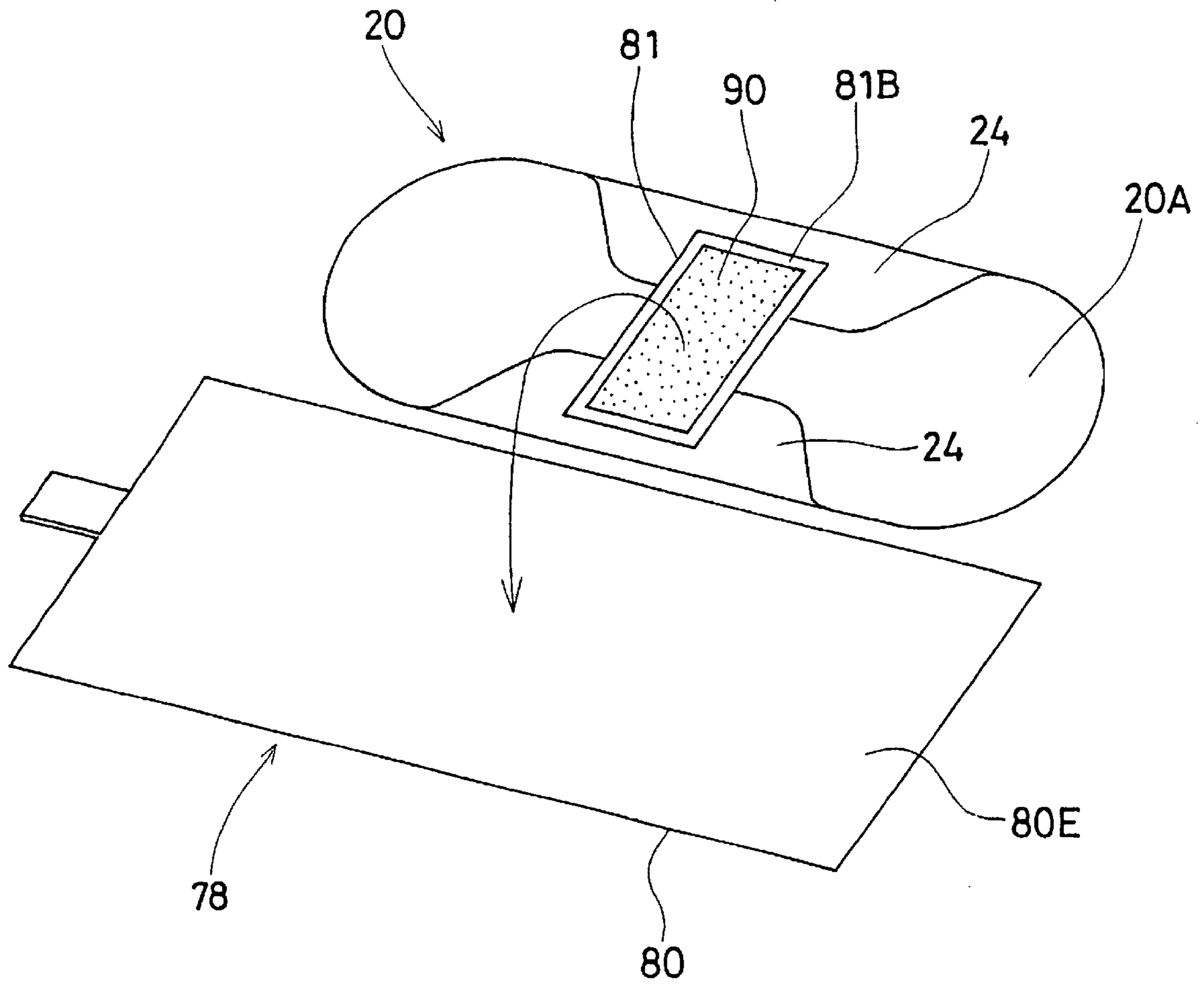


Fig. 9

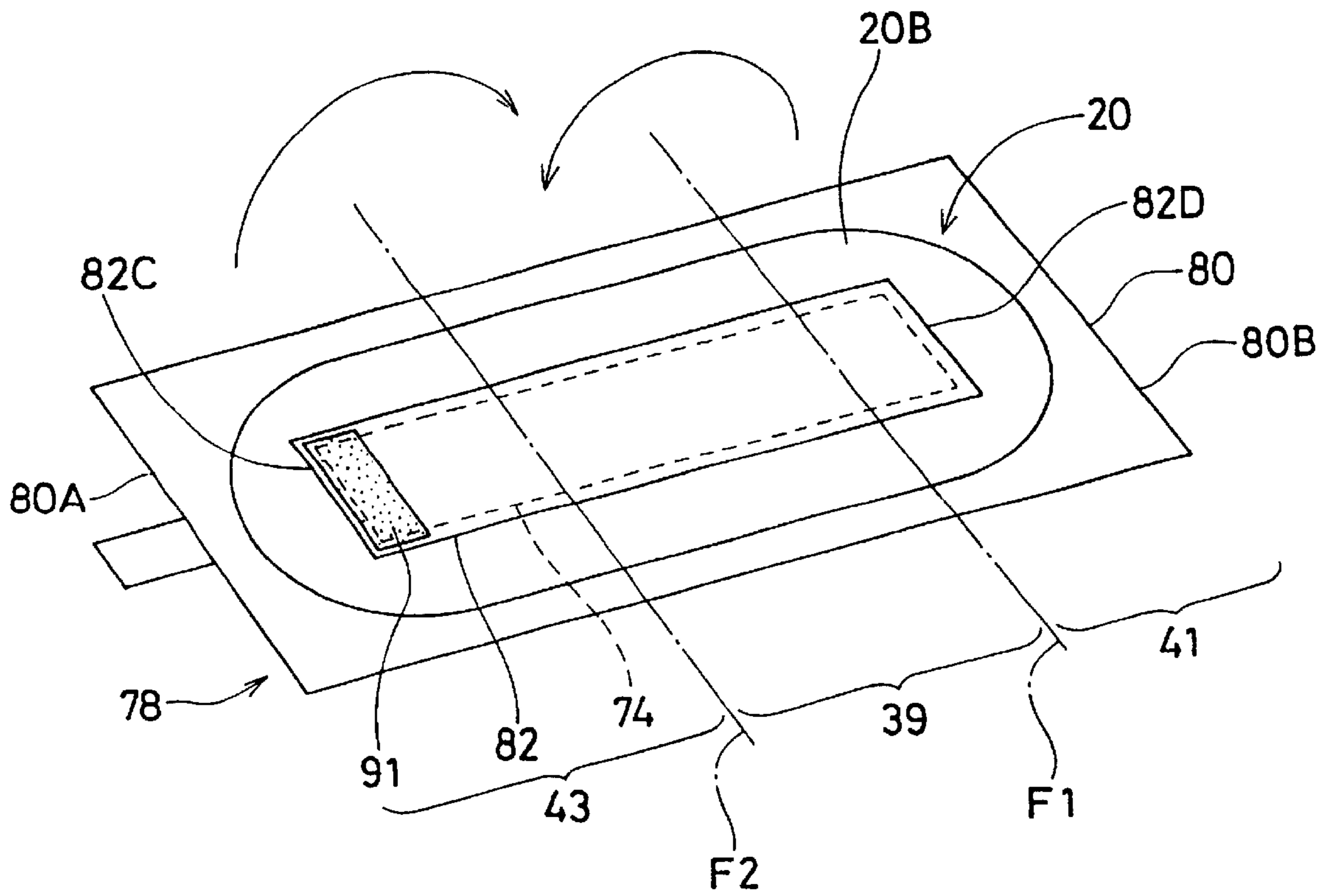


Fig. 10

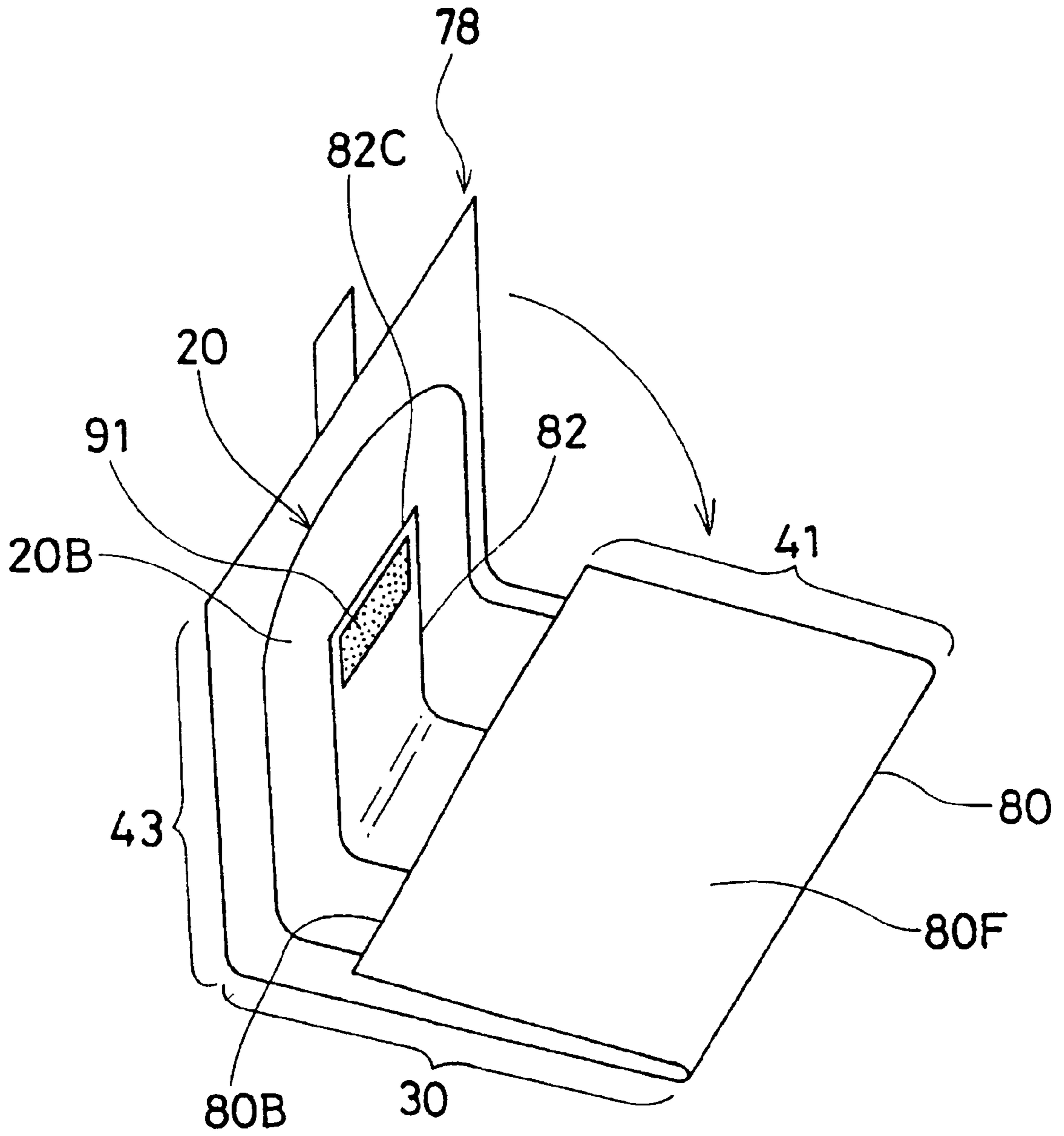


Fig. 11

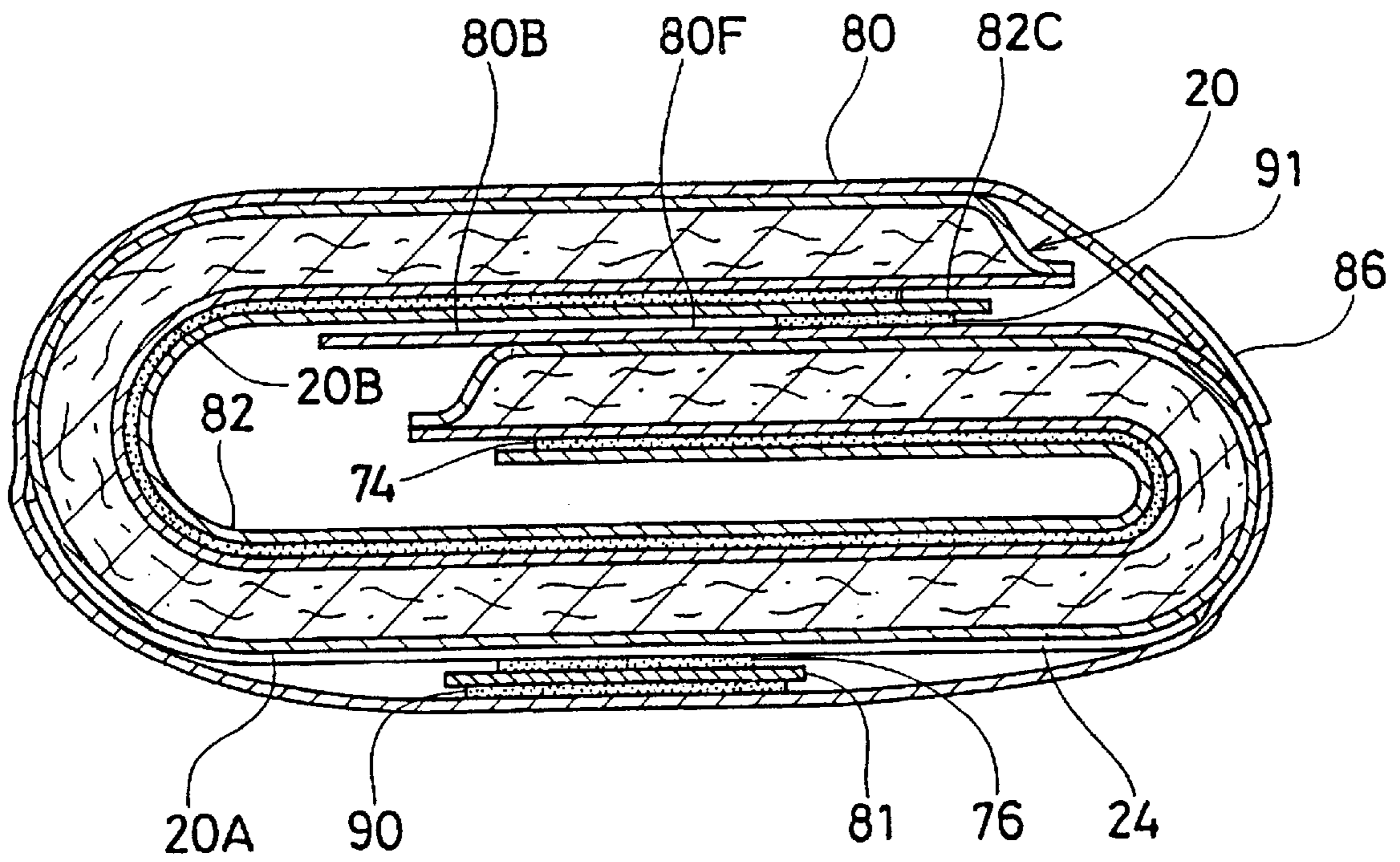


Fig. 12

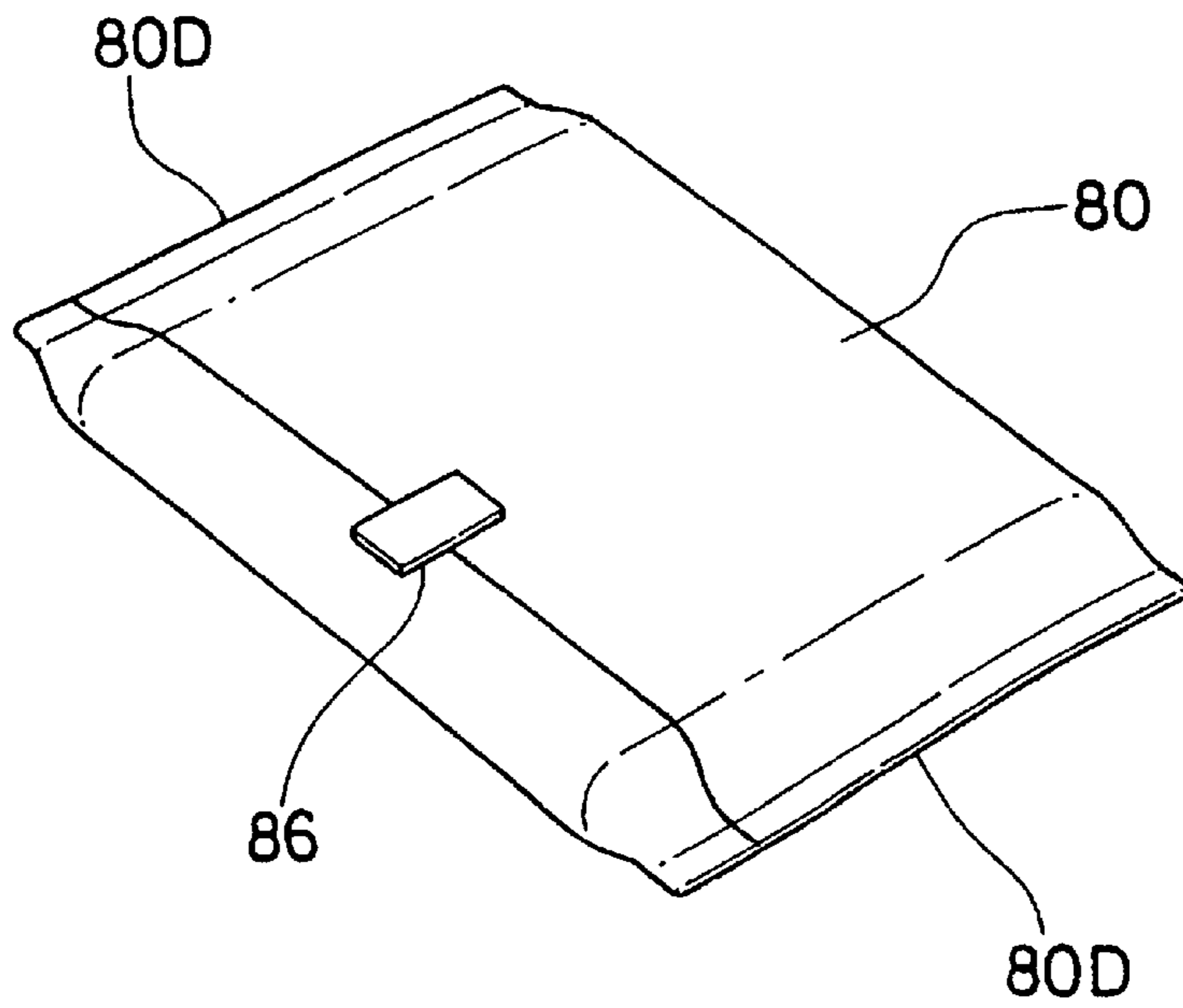


Fig. 13

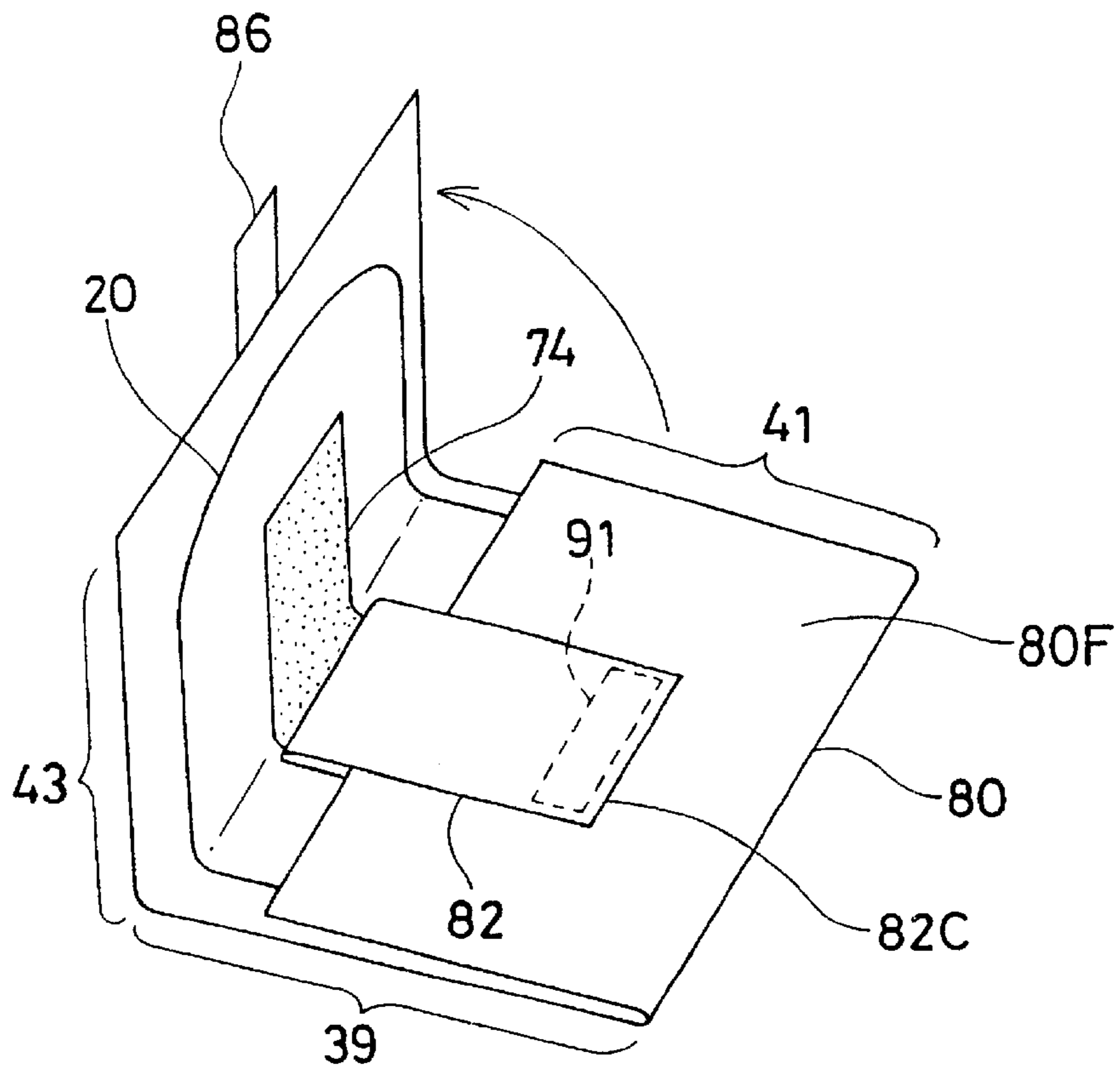


Fig. 14

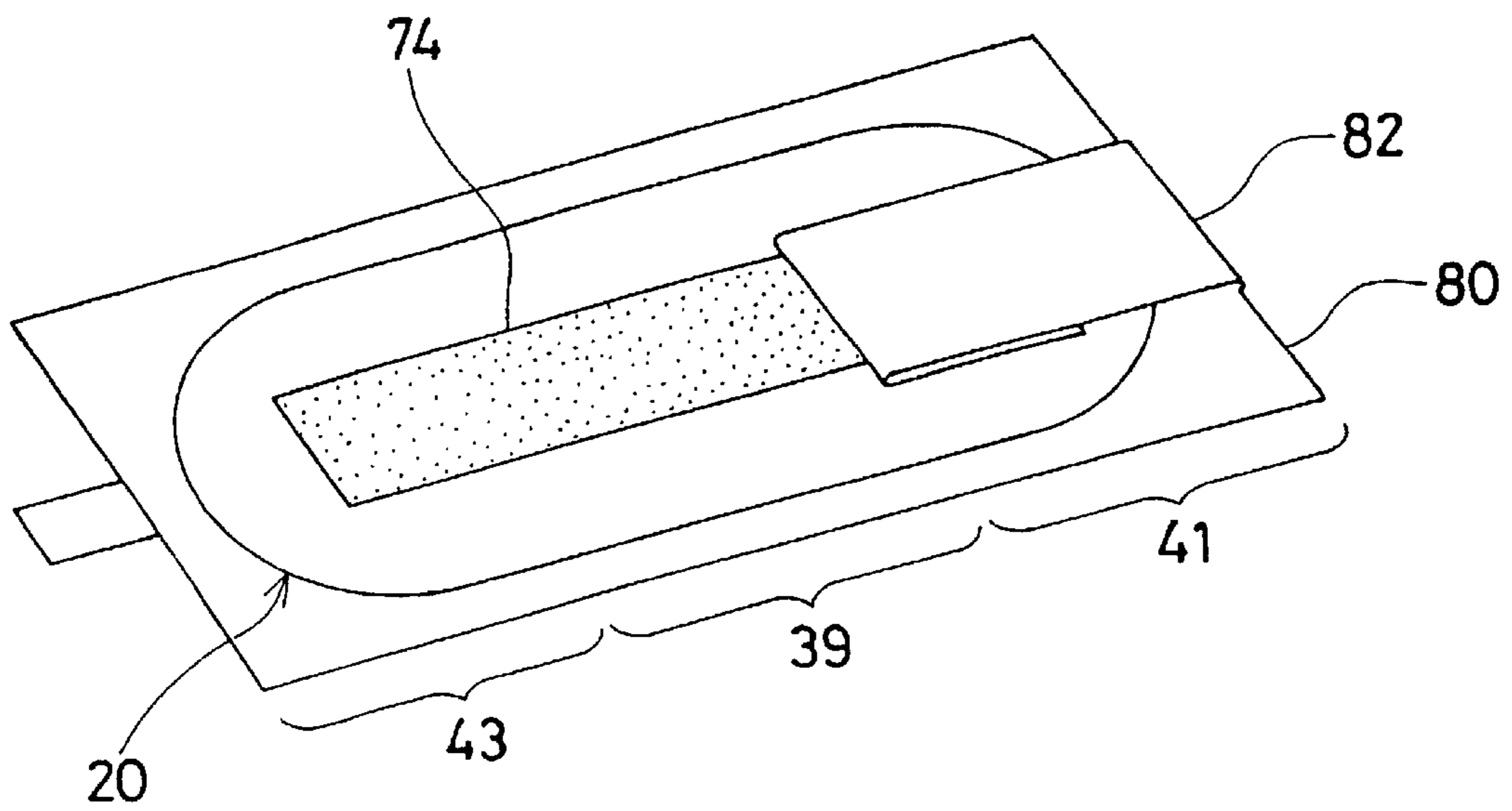


Fig. 15

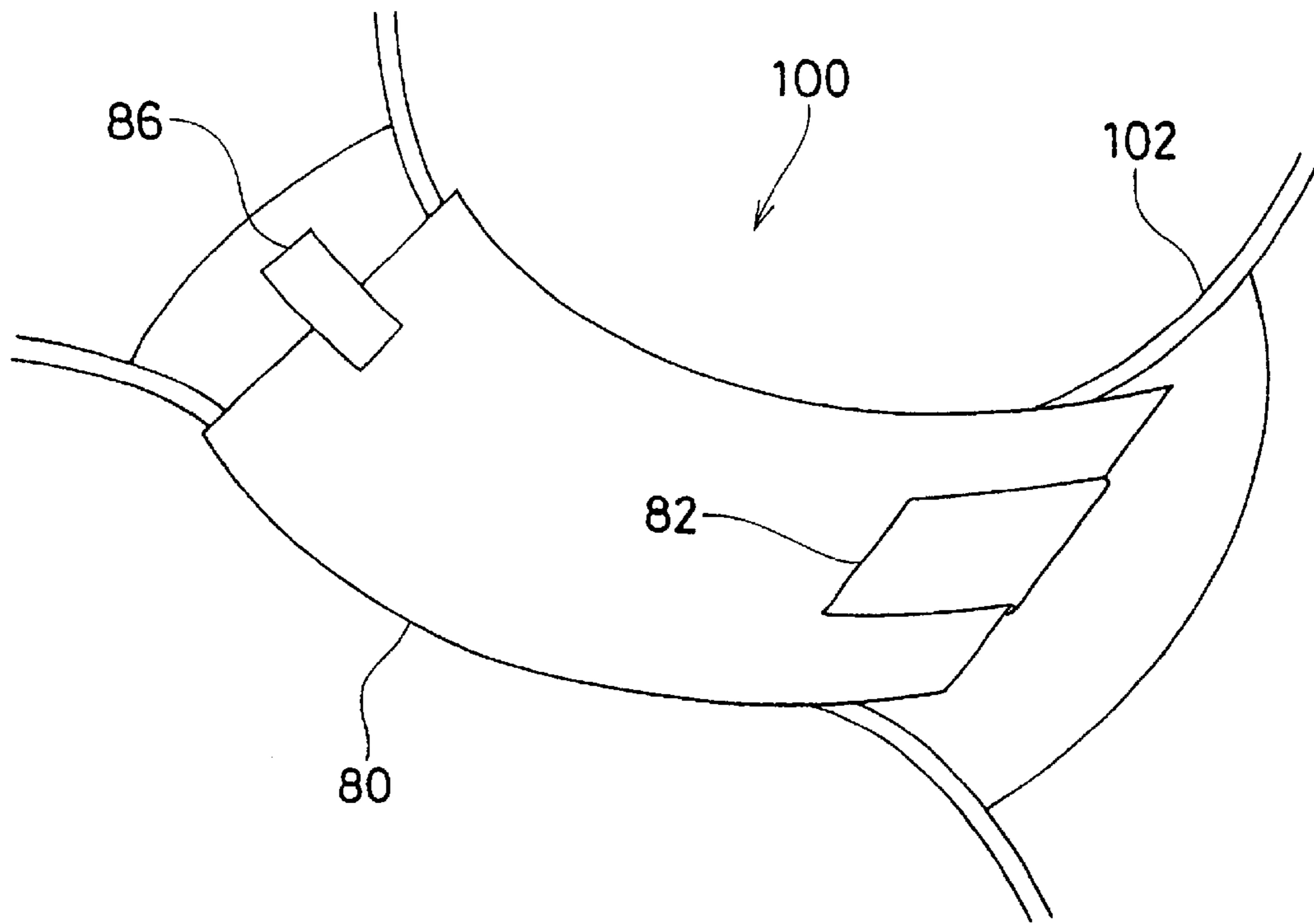


Fig. 16

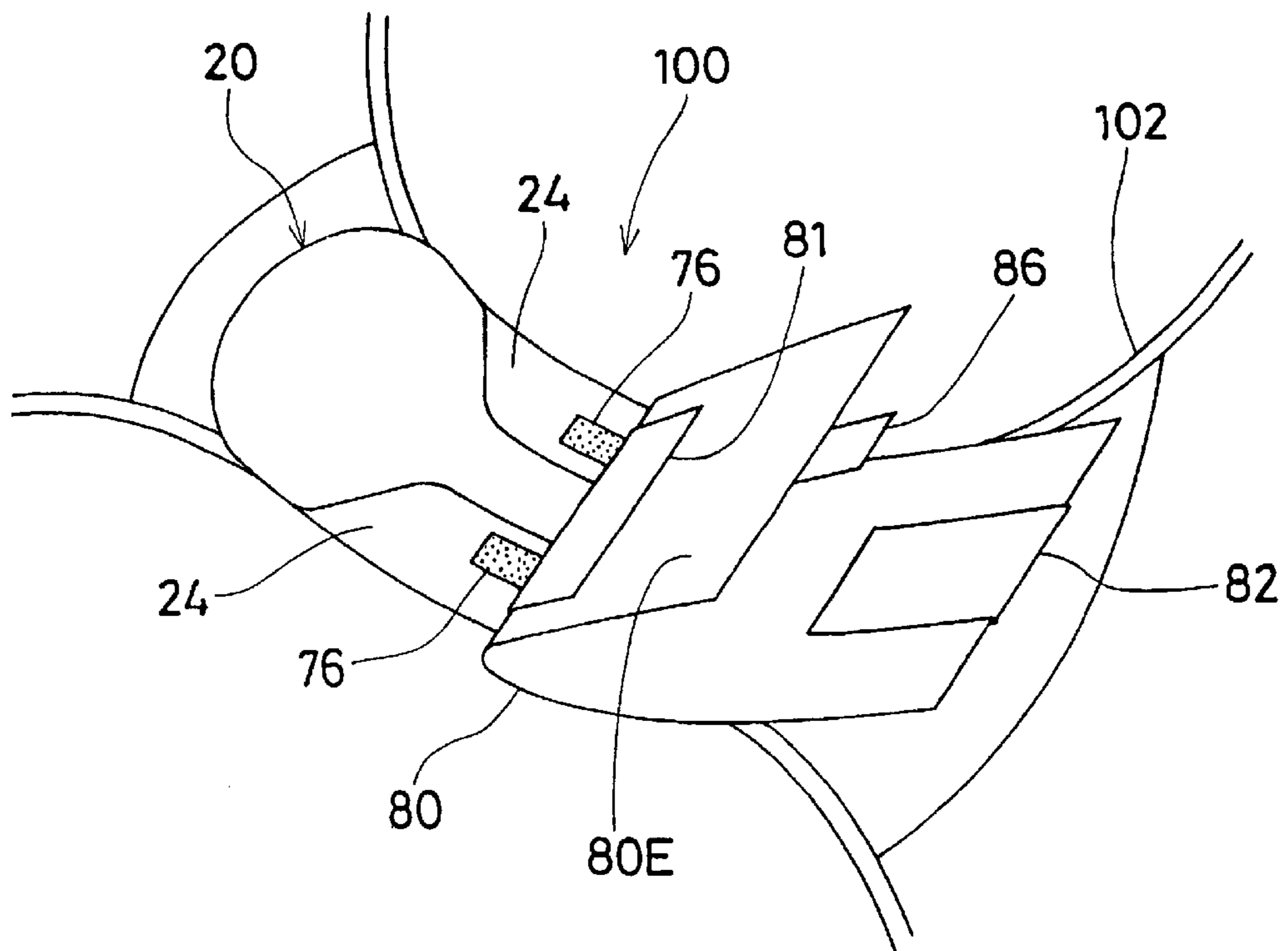


Fig. 17

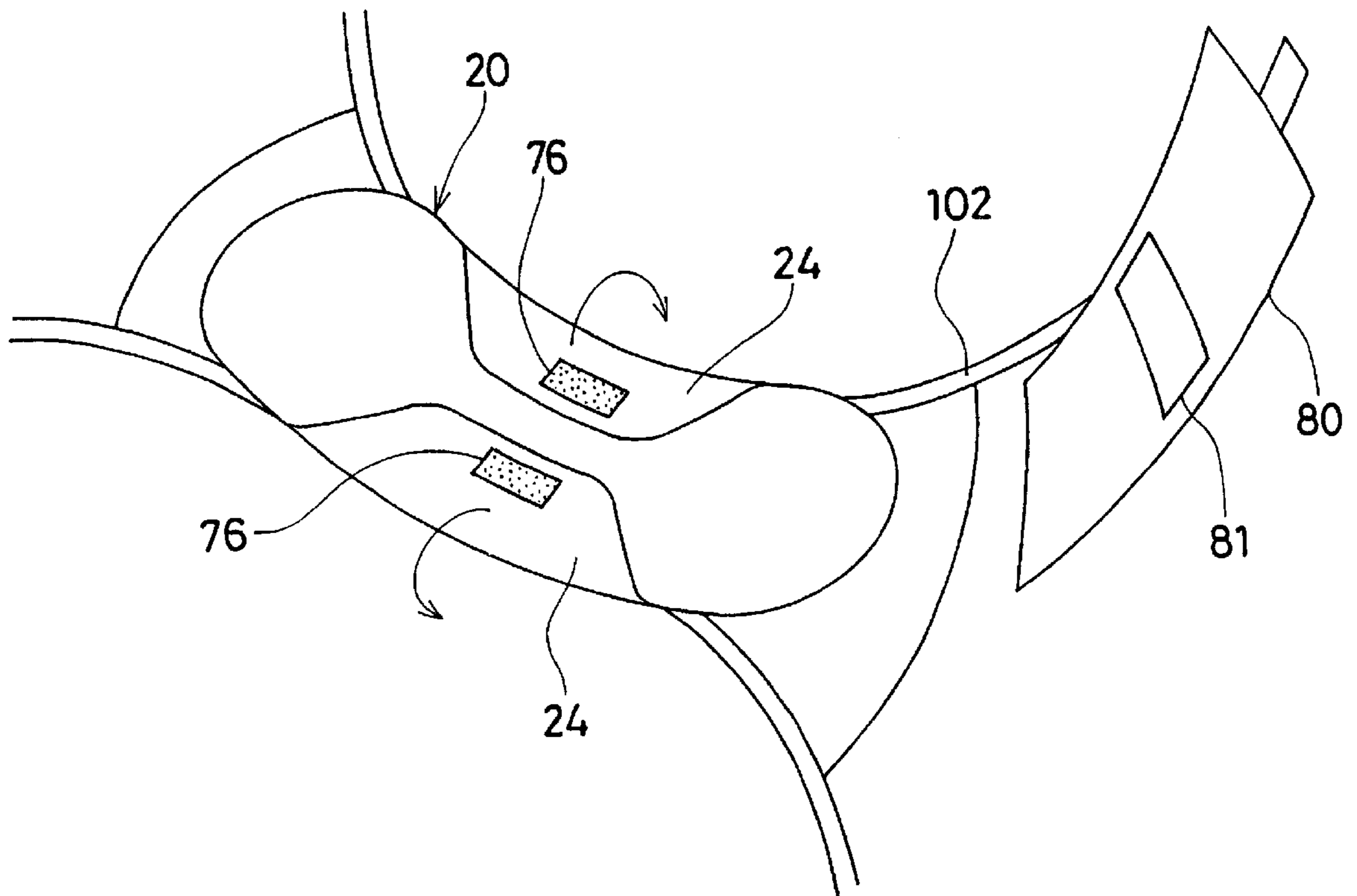


Fig. 18

INDIVIDUALLY PACKAGED ABSORBENT ARTICLE

FIELD

This invention relates to an individually packaged absorbent article.

BACKGROUND

Absorbent articles which are used to absorb body exudates, such as disposable diapers, adult incontinence products or sanitary napkins are well known. Such absorbent articles typically have a body surface which may include a liquid permeable topsheet, a garment surface which may include a liquid impermeable backsheet, and an absorbent therebetween. When the absorbent article is used, the body surface of the absorbent article is placed facing the wearer's body and the garment surface is placed against the wearer's undergarment. The body surface of the absorbent article must be kept hygienic prior to use of the absorbent article because the body surface directly touches the wearer's body. Typically, an absorbent article such as a sanitary napkin is individually wrapped by a wrapper to protect the absorbent article from contamination. Such individually packaged absorbent articles are disclosed in, for example, JP Utility Model Laid-open publication 95/39820 published on Jul. 18, 1995, JP Utility Model Laid-open publication 94/75446 published on Oct. 25, 1994, and JP Patent Laid-open publication 91/176376 published on Jul. 31, 1991. In certain known designs, an absorbent article such as a sanitary napkin is folded into three portions such that the body surface of the sanitary napkin is oriented inwardly to the folded sanitary napkin and the garment surface is wrapped by a wrapper. The garment surface of the sanitary napkin also includes a main fastener, which is covered by the wrapper, to secure the sanitary napkin to the undergarment. In these absorbent articles, the body surface is protected from contact by the wearer's hands before the sanitary napkin is unfolded for application to the wearer's undergarment. However, the wearer must open and remove the wrapper from the sanitary napkin and unfold the sanitary napkin when applying the sanitary napkin to the wearer's undergarment. In the configuration where the wrapper and the sanitary napkin are opened, the main fastener of the sanitary napkin is still covered by the wrapper and is not exposed while the body surface of the sanitary napkin is exposed. Therefore, the wearer must remove the wrapper from the sanitary napkin to expose the main fastener. During this process, the wearer may touch the body surface of the sanitary napkin. This causes body surface contamination. In addition, while the wearer applies the sanitary napkin to the undergarment after removing the wrapper, the wearer tends to apply the sanitary napkin by touching the body surface and/or by pushing the body surface of the sanitary napkin toward the undergarment to secure the main fastener provided on the garment surface to the undergarment. This also causes body surface contamination. Thus, there is no convenient means to protect the body surface of the sanitary napkin while the wearer removes the wrapper from the sanitary napkin and applies the sanitary napkin to the undergarment.

Attempts to protect the body surface of the sanitary napkin during the application of the sanitary napkin to the undergarment have been made. For example, JP Patent Laid-open publication 96/56989 discloses an absorbent article such as a sanitary napkin having a surface cover sheet

covering the body surface of the main body portion of the sanitary napkin. This sanitary napkin also has a release paper covering adhesive provided on the garment surface of the sanitary napkin. The wearer must remove the release paper covering the adhesive of the garment surface before the wearer applies the sanitary napkin to the undergarment. It is quite inconvenient for the wearer.

Base on the foregoing, there is a need for an absorbent article individually packaged by a wrapper having a main wrapper sheet wherein the body surface of the absorbent article remains protected from, e.g., the wearer's hands during unwrapping and application. None of the existing art provides all of the advantages and benefits of the present invention.

SUMMARY

The present invention provides an individually packaged absorbent article. The individually packaged absorbent article comprises an absorbent article and a wrapper. The absorbent article extends in a longitudinal direction and includes a main body portion having a pair of longitudinal side edges, a pair of end edges, a garment surface, and a body surface. The garment surface of the main body portion has a main fastener. The wrapper for the absorbent article has a main wrapper sheet and a main fastener cover. The body surface of the main body portion is disposed to face the main wrapper sheet. The main fastener of the main body portion is covered by the main fastener cover. The main fastener cover is joined to the main wrapper sheet. The main body portion and the wrapper are folded as a unit at least about one transverse axis such that the garment surface is oriented inwardly with respect to the folded unit. At least a part of the main fastener is exposed when the wrapper is opened.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims which particularly point out and distinctly claim the invention, it is believed the present invention will be better understood from the following description of preferred embodiments taken in conjunction with the accompanying drawings, in which like reference numerals identify identical elements and wherein:

FIG. 1 is a top plan view of a preferred embodiment of the wrapper of the present invention in an opened position with a preferred sanitary napkin disposed thereon;

FIG. 2 is a cross-sectional view of the wrapper and the sanitary napkin taken along the line II—II of FIG. 1;

FIG. 3 is a top plan view of the sanitary napkin shown in FIG. 1 with the flaps outstretched;

FIG. 4 is a top plan view of the sanitary napkin shown in FIG. 1 with the flaps folded over the topsheet and covered by the flap fastener cover;

FIG. 5 is a cross-sectional view of the wrapper and the sanitary napkin taken along the line V—V of FIG. 1;

FIG. 6 is a cross-sectional view of an alternative embodiment of the wrapper and the sanitary napkin;

FIG. 7 is a perspective view of one preferred wrapper shown in FIG. 1;

FIG. 8 is a perspective view of an alternative embodiment of the wrapper,

FIG. 9 is a first schematical perspective view showing a packaging process of the sanitary napkin by the wrapper;

FIG. 10 is a second schematical perspective view showing a packaging process of the sanitary napkin by the wrapper;

FIG. 11 is a third schematical perspective view showing a packaging process of the sanitary napkin by the wrapper;

FIG. 12 is a cross-sectional view (taken along the longitudinal centerline) of the sanitary napkin and the wrapper folded by the processes shown in FIGS. 9-11;

FIG. 13 is a perspective view of an embodiment of individually packaged absorbent article of the present invention assembled by utilizing the processes shown in FIGS. 9-11,

FIG. 14 is a first schematical perspective view showing an opening process of the individually packaged sanitary napkin assembled by utilizing the processes shown in FIGS. 9-11;

FIG. 15 is a second schematical perspective view showing an opening process of the individually packaged sanitary napkin assembled by utilizing the processes shown in FIGS. 9-11;

FIG. 16 is a first schematical perspective view showing an applying process of the sanitary napkin to the undergarment assembled by utilizing the processes shown in FIGS. 9-11;

FIG. 17 is a second schematical perspective view showing an applying process of the sanitary napkin to the undergarment assembled by utilizing the processes shown in FIGS. 9-11; and

FIG. 18 is a third schematical perspective view showing an applying process of the sanitary napkin to the undergarment assembled by utilizing the processes shown in FIGS. 9-11.

DETAILED DESCRIPTION OF THE INVENTION

All cited references are incorporated herein by reference in their entireties. Citation of any reference is not an admission regarding any determination as to its availability as prior art to the claimed invention.

“Comprising” means that other steps and other elements which do not affect the end result can be added. This term encompasses the terms “consisting of” and “consisting essentially of”.

Individually wrapped absorbent articles such as sanitary napkins are useful to protect the absorbent article from contamination. Such absorbent articles may be wrapped by a wrapper including a main wrapper sheet and a main fastener cover. The main wrapper sheet may be provided in order to protect a body surface of an absorbent article from contamination during application of the absorbent article to the undergarment. The main fastener cover may be provided in order to protect a main fastener provided on the garment surface of the absorbent articles. If the absorbent articles have two separate elements of material to protect portions of the absorbent articles and if the wearer must remove those elements separately prior to application process of the absorbent article to the undergarment, it is quite inconvenient for the wearer. The present invention answers the need for an individually wrapped absorbent article whose body surface remains protected from, e.g., the wearer's hands during application of the absorbent article. Additionally, the present invention provides an absorbent article having a main wrapper sheet and a main fastener cover in which the wearer does not have to give an extra step of removing the main fastener cover prior to application process of the absorbent article to the undergarment. These and other features of the present invention are discussed in more detail below.

Referring now to the drawings, the present invention is disclosed in a preferred but non-limiting embodiment. As

shown in FIGS. 1 and 2, the present invention includes a wrapper 78 for a disposable absorbent article, particularly a sanitary napkin 20.

The sanitary napkin 20 is used to collect vaginal discharges, such as menses, and prevent soiling of the wearer's clothing by such discharges. As shown in FIGS. 1, 2, and 3, the sanitary napkin 20 basically includes a main body portion 22. The sanitary napkin 20 may include a pair of flaps 24 which will be folded to wrap the edge of the wearer's undergarment when in use. The main body portion 22 of the sanitary napkin 20 may have a main body fastener, such as a pressure sensitive adhesive fastener thereon for fastening the main body portion 22 in the wearer's undergarment. The flaps 24 preferably each have flap fasteners thereon, such as a pressure sensitive adhesive fastener, for releasably affixing the flaps 24 of the sanitary napkin 20 in a configuration folded around the edges of the crotch of the wearer's undergarment. The wrapper 78 serves to cover and protect the flap fasteners and the body surface of the sanitary napkin 20, and is folded around the sanitary napkin 20 to provide an individual package for the sanitary napkin 20.

The sanitary napkin 20 (and the main body portion 22 thereof) has two surfaces, a liquid pervious body-contacting surface or “body surface” 20A that is intended to be worn adjacent to the body of the wearer, and a liquid impervious garment surface 20B. The sanitary napkin 20 is shown in FIG. 3 as viewed from its body surface 20A. The sanitary napkin 20 (with the other elements, such as the wrapper 78) is shown in FIG. 1 as viewed from its garment surface 20B. The sanitary napkin 20 has two centerlines, a principal longitudinal centerline L and a principal transverse centerline (not shown in FIGS). Herein “longitudinal” refers to a line, axis or direction in the plane of the sanitary napkin 20 that is generally aligned with (e.g. approximately parallel to) a vertical plane which bisects a standing wearer into left and right body halves when the sanitary napkin 20 is worn. Herein “transverse” “lateral” or “width” are interchangeable, and refer to a line, axis or direction which lies within the plane of the sanitary napkin 20 that is generally perpendicular to the longitudinal direction.

FIG. 3 shows the main body portion 22 and the flaps 24 of the sanitary napkin 20. The main body portion 22 has two spaced apart longitudinal side edges 26, two spaced apart transverse or end edges (or “ends”) 28, which together form the periphery 30 of the main body portion 22. The main body portion 22 also has three sections including a central section (first section) 36, one end section (second section) 34 and the other end section (third section) 32. The first section 36 is disposed between the second section 34 and the third section 32. The second section 34 and the third section 32 extend outwardly in the longitudinal direction from the edges of the central section 36 of the main body portion 22. When the sanitary napkin 20 is individually packaged, the main body portion 22 and the wrapper 78 are folded as a unit into three regions including a first region 39, a second region 41, and a third region 43 divided by two fold axes F1 and F2 (refer to FIG. 1). The first section 36, the second section 34 and the third section 32 of the main body portion 22 generally extend in the first region 39, the second region 41 and the third region 43, respectively.

The main body portion 22 of the sanitary napkin 20 can be of any thickness, including relatively thick, intermediate thickness, relatively thin, or even very thin (or “ultra thin”). An “ultra-thin” sanitary napkin 20 as described in U.S. Pat. Nos. 4,950,264 and 5,009,653 issued to Osborn on Aug. 21, 1990 and Aug. 23, 1991 respectively preferably has a caliper of less than about 3 millimeters. The embodiment of the

sanitary napkin **20** shown in the drawings is intended to be an example of a sanitary napkin of an intermediate thickness. The main body portion **22** of the sanitary napkin **20** may also be relatively flexible, so that it is comfortable for the wearer. It should be understood that the sanitary napkin shown is merely one embodiment, and that the wrapper of the present invention is not limited to use with absorbent articles of the type or having the specific configurations shown in the drawings.

FIG. 2 shows the individual components of the main body portion **22** of the sanitary napkin **20**. The main body portion **22** of the sanitary napkin **20** preferably has at least three primary components. These include a liquid pervious topsheet **38**, a liquid impervious backsheet **40**, and an absorbent core **42** positioned between the topsheet **38** and the backsheet **40**. The topsheet, the backsheet, and the absorbent core may be assembled in a variety of configurations known in the art (including layered or "sandwich" configurations and wrapped or "tube" configurations). Suitable materials for the components of the main body portion **22**, and some of the various configurations in which such components can be assembled are described generally in, e.g., U.S. Pat. No. 4,321,924, entitled "Bordered Disposable Absorbent Article" issued to Ahr on Mar. 30, 1982; U.S. Pat. No. 4,425,130, entitled "Compound Sanitary Napkin" issued to DesMarais on Jan. 10, 1984; U.S. Pat. No. 4,950,264, entitled "Thin, Flexible Sanitary Napkin" issued to Osborn on Aug. 21, 1990; U.S. Pat. No. 5,308,346, entitled "Elasticized Sanitary Napkin" issued to Sneller, et al. on May 3, 1994, and U.S. Pat. No. 5,389,094, entitled "Absorbent Article Having Flaps and Zones of Differential Extensibility" issued to Lavash, et al. on Feb. 14, 1995. The main body portion **22** of the sanitary napkin **20** may also be formed by one or more extensible components such as those sanitary napkins, and the like described in, e.g., U.S. patent application Ser. Nos. 07/915,133 and 07/915,284, both filed Jul. 23, 1992, in the name of Osborn, et al. (PCT Publication Nos. WO 93/01785 and 93/01786, both published Feb. 4, 1993).

FIG. 2 shows a preferred embodiment of the sanitary napkin **20** assembled in a sandwich construction in which the topsheet **38** and the backsheet **40** have length and width dimensions generally larger than those of the absorbent core **42**. The topsheet **38** and the backsheet **40** extend beyond the edges of the absorbent core **42** to form portions of the periphery **30**. The topsheet **38** is preferably joined to the body-facing side of the absorbent core **42** and the backsheet **40** is preferably joined to the garment-facing side of the absorbent core **42**. The topsheet **38** and backsheet **40** can be joined to the absorbent core **42** in any suitable manner known in the art for this purpose, such as by an open pattern of adhesives. The portions of the topsheet **38** and backsheet **40** that extend beyond the edges of the absorbent core **42** are preferably also joined to each other. These portions of the topsheet **38** and backsheet **40** can also be joined in any suitable manner known in the art. Preferably, in the embodiment shown, these portions of the topsheet **38** and backsheet **40** are joined using adhesives over substantially the entire portions that extend beyond the edges of the absorbent core **42**, and a crimp seal around the periphery **30** of the main body portion **22** where the topsheet **38** and backsheet **40** are densified by the application of pressure or heat and pressure.

The sanitary napkin **20** shown in FIG. 3, as discussed above, may have a pair of flaps **24** that are joined to the main body portion **22**. The flaps **24** extend laterally outward beyond the longitudinal side edges **26** of the main body portion **22** from their proximal edges **44** to their distal edges

(or "free ends") **46**. The flaps **24** extend laterally outward from at least a part of the first section **36** of the main body portion **22** and majority of the flaps **24** extends in the first region **39** divided by the fold axes F1 and F2 (refer to FIG. 1).

The flaps **24** can be joined to the main body portion **22** in any suitable manner. Herein "joined" encompasses configurations in which an element is directly secured to another element by affixing the element directly to the other element, configurations in which the element is indirectly secured to the other element by affixing the element to intermediate member(s) which in turn are affixed to the other element; and configurations in which one element is integral with another element, i.e., one element is essentially part of the other element. Preferably, in the embodiment shown in FIG. 3, the flaps **24** are integral with the main body portion **22** (that is, the flaps **24** are formed by integral extensions of the backsheet **40**; alternatively, the flaps **24** may be formed by integral extensions of the topsheet **38** and the backsheet **40** which are coextensive).

In other alternative embodiments, the flaps **24** can be formed by one or more separate components that are joined to the garment-facing side of the main body portion **22**. Preferably, in such a case, the flaps **24** each are formed by a separate component that is joined to the garment-facing side of the main body portion **22**. In such alternative embodiments, the flaps **24** are preferably otherwise unattached to the garment-facing side of the main body portion **22** of the sanitary napkin **20** between the points where they are attached to the main body portion **22** and the longitudinal side edges **26** of the main body portion **22**. The flaps **24** in these latter embodiments can be joined to the garment-facing side of the main body portion **22** by any suitable attachment mechanism. Suitable attachment mechanisms include, but are not limited to adhesives, and the like.

The places or regions on the sanitary napkin **20** where the flaps **24** are joined to (or extend from) the main body portion **22**, are referred to herein as "junctures". These regions will typically be longitudinally-oriented (or "longitudinal") junctures, such as lines of juncture **48**. These regions can be any of various curved or straight lines, but they are not limited to lines. Thus, the junctures may include flanges, strips, intermittent lines, and the like.

The flaps **24** may be of any configuration desired. For example, the flaps **24** are provided with zones of extensibility (not shown in FIGS.) in the front edge and the back edge of each flap **24**. The zones of extensibility relieve stresses which are created in the flaps **24** by the folding of the flaps **24** around the crotch of the wearer's undergarment. The zones of extensibility thereby help eliminate bunching of the flaps **24** caused by said stresses. The zones of extensibility may be formed by pre-corrugated or "ring rolled" regions of the flaps **24** in which the corrugations define ridges and valleys that are oriented at an angle to the principal longitudinal centerline L. Suitable structures for providing the flaps **24** with zones of extensibility are described in greater detail in, e.g., U.S. Pat. No. 5,389,094 issued to Lavash, et al. and in commonly assigned copending U.S. patent application Ser. No. 08/380,769, entitled "Absorbent Article Having Flaps With Gathered Portions" filed in the name of Sue A. Mills, et al. on Jan. 30, 1995.

The sanitary napkin **20** preferably also has fasteners for securing the sanitary napkin **20** in place in a wearer's undergarment. FIGS. 3 and 4 show a preferred arrangement of fasteners which includes a main body fastener, such as a main body adhesive **74**, and flap fasteners, such as flap

adhesives **76**. The fasteners used with the sanitary napkin **20** are not limited to adhesive fasteners. Any suitable type of fastener known in the art can be used for this purpose. For example, the sanitary napkin **20** could be secured in place in a wearer's undergarment by mechanical fasteners, such as VELCRO®, or by a combination of adhesive and mechanical fasteners. For simplicity, however, the fasteners will be described in terms of adhesive fasteners and these fasteners are preferably pressure sensitive adhesive fasteners. Suitable pressure sensitive adhesive fasteners are described in greater detail in, e.g., U.S. Pat. No. 4,917,697 issued to Osborn, et al. on Apr. 17, 1990.

The main body adhesive **74** and the flap adhesives **76** can be provided in any suitable configuration. In the preferred embodiment shown in FIGS. **1** and **3**, the main body adhesive **74** is provided in the form of one longitudinally oriented strip of adhesive that is centered about the principal longitudinal centerline **L**. The main body adhesive **74** may be provided in the form of two or more longitudinally oriented strips of adhesive which are disposed parallel to each other. Alternatively, the main body adhesive **74** may be provided in the form of two or more generally rectangular patches of adhesive which are disposed in the longitudinal direction at a distance. The flap adhesives **76** are provided in the form of a generally rectangular patch of adhesive on each flap **24**. The main body adhesive **74** provides an adhesive attachment means for securing the main body portion **22** of the sanitary napkin **20** against the crotch portion of a panty. The flap adhesives **76** are used to assist in maintaining the flaps **24** in position after they are wrapped around the edges of the crotch portion of the panty. The flaps can be maintained in position by attaching the flaps **24** to the undergarment, or to the opposing flap. Alternatively, the flaps **24** may not be provided with the flap adhesive.

FIGS. **1**, **2** and **7** show one preferred version of the wrapper **78**. The wrapper **78** may be formed by a single element or may be formed by several elements. These elements can be formed by integral portions of a single member or article, or they can be formed by separate components joined to a member or article. The elements constituting the wrapper **78** include: a main wrapper sheet **80**; a main fastener cover **82**; and optionally may include a flap fastener cover **81** (not shown in FIG. **2**) if the flap **24** is provided and the flap adhesive **76** is provided on the flap **24**.

The main wrapper sheet **80** is the portion of the wrapper **78** which will be folded around the sanitary napkin **20** to provide an individual package for the sanitary napkin **20**. The main wrapper sheet **80** preferably covers the side of the body surface **20A** of the sanitary napkin **20** and is releasably affixed to the sanitary napkin **20** as described hereinafter. As shown in FIGS. **1** and **7**, the main wrapper sheet **80** has two surfaces, inner surface **80E** and outer surface **80F** (refer to FIG. **2**). The inner surface **80E** is the surface facing the sanitary napkin **20**. The main wrapper sheet **80** preferably has dimensions that are slightly larger than those of the main body portion **22** of the sanitary napkin **20**. Preferably, the main wrapper sheet **80** has longitudinal side portions **80D** which extend beyond the longitudinal side edges **26** of the main body portion **22** of the sanitary napkin **20**. The main wrapper sheet **80** preferably also has a first end portion **80A** and a second end portion **80B** which extend beyond the end edges **28** of the main body portion **22**. It is recognized, however, that satisfactory protection of sanitary napkin **20** may be afforded by a wrapper which is not larger than the main body portion **22** of the sanitary napkin **20**. The main wrapper sheet **80** can be made from any suitable material. The main wrapper sheet **80** is preferably manufactured from

a thin flexible material which is liquid impermeable so that the wrapper **78** will be suitable for wrapping and disposing of a used sanitary napkin **20**. For example, polyethylene films have been found to work well. The main wrapper sheet **80** may be formed by an opaque material, a semi-transparent material, or a transparent material. An opaque main wrapper sheet **80** offers the advantage of discreteness when used to rewrap a used/soiled sanitary for disposal. However, a semi-transparent or a transparent main wrapper sheet **80** facilitates visual placement of the sanitary napkin onto the undergarment.

Referring to FIGS. **1**, **5** and **7**, the main fastener cover (or "main adhesive cover") **82** is provided to cover and protect the main body adhesive **74**. The main adhesive cover **82** may be formed by a thin sheet-like element such as a paper or a plastic film. If a separate release paper is used, it can be formed by any suitable material known in the art for this purpose, such as coated papers. Suitable release papers are described in, e.g., U.S. Pat. No. 4,917,697 issued to Osborn, Apr. 17, 1990. The main adhesive cover **82** has two faces, one of which is a non-stick face (or releasable face) **82A** which is capable of releasable attachment with the main fastener, and an opposite face or side **82B**. When the main fasteners are formed by adhesive fasteners, the non-stick face **82A** can be provided by attaching a separate release paper or element to the main adhesive cover **82** which is treated with a non-stick material, or by treating all or a portion of the main adhesive cover **82** with a non-stick coating, such as by silicone coating a portion of the main adhesive cover **82**. Alternatively, if the main fasteners **74** are formed by mechanical fasteners, such as VELCRO® fasteners, the non-stick face may be provided by a non-woven material capable of releasably engaging the mechanical fastening material. The opposite side **81B** of the flap adhesive cover **81** need not have, and preferably does not have, a release coating thereon. The main adhesive cover **82** also has longitudinal side portions **82E**, a fixed end portion **82C** fixed proximate to the second end portion **80B** of the main wrapper sheet **80**, and a free end portion **82D** located proximate to the end edge **28** of the sanitary napkin **20** in the second region **41** (refer to FIG. **5**). The opposite face **82B** of the fixed end portion **82C** faces the outer surface **80F** proximate to the second end portion **80B** and is joined thereto by any suitable means such as adhesive **91**. The free end portion **82D** is folded such that the non-stick face **82A** faces the main body adhesive **74** in the second region **41**.

The main adhesive cover **82** can be of any suitable size and shape, though the figures depict a main adhesive cover **82** which is only of sufficient width and length to cover and protect the main body adhesive **74**. Preferably, the lateral width of the main adhesive cover **82** is narrower than that of the main wrapper sheet **80**. Thereby, the longitudinal side portions **82E** do not extend into a frangible sealed region (explained later) of the longitudinal side portions **80D** of the main wrapper sheet **80** which is to complete the individual packaging.

FIG. **8** shows an alternative embodiment of the wrapper **78** having a main wrapper sheet **80** and a main adhesive cover **82**. In the embodiment shown in FIG. **8**, instead of being a separate component of the main wrapper sheet **80**, the main adhesive cover **82** is an integral portion of the main wrapper sheet **80**.

The flap fastener cover (or "flap adhesive cover") **81** (if provided) covers and protects the flap adhesives **76** in a packaged configuration of the sanitary napkin **20** by the wrapper **78**. It also maintains the flaps **24** in position folded over the topsheet **38**. FIG. **4** shows one example of the flap

adhesive cover **81** formed by a separate flap adhesive cover sheet before the flap adhesive cover **81** is joined to the main wrapper sheet **80**. Such a release paper **81** can be laminated to the inner surface **80E** of the main wrapper sheet **80** as shown in FIG. 2 before or after the flap adhesive cover **81** is releasably affixed to the flap adhesives **76**. The flap adhesive cover **81** has two faces, one of which is a non-stick face (or releasable face) **81A** which is capable of releasable attachment with the flap fasteners, and an opposite face or side **81B**. As shown in FIG. 2, the non-stick face **81A** is disposed to face the flap adhesives **76** such that it will be able to releasably adhere to the flap adhesive **76**. The opposite side **81B** faces away from the flap adhesives **76** as shown in FIGS. 2 and 4. The opposite side **81B** is joined to the inner surface **80E** of the main wrapper sheet **80** by any suitable means such as adhesive layer **90** as shown in FIG. 2. As the main wrapper sheet **80** is removed from the sanitary napkin **20**, the flap adhesive cover **81** is removed from the flap adhesives **76** of the sanitary napkin **20** while remaining on the main wrapper sheet **80**. The non-stick surface **81A** may be formed by the same material or element as the non-stick face **82A** of the main adhesive cover **82**. The opposite side **81B** may have, or may not have, a release coating thereon. Alternatively, as shown in FIG. 6, the flap adhesive cover **81** may be provided on the main wrapper sheet **80** as a release coating. The flap adhesives **76** may be releasably affixed to the release coating **81**. If a release coating is used, the coating can be applied directly to the inner surface **80E** of the main wrapper sheet **80**. Such a coating can be formed by any material known in the art for this purpose, with silicone coatings being preferred. If a coating is used, the coating **81** may be provided by coating only that zone of the main wrapper sheet **80** which will substantially contact the flap adhesives **76**. Alternatively, the entire inner surface **80E** of the main wrapper sheet **80** may be coated. Coating the entire inner surface of a wrapper is disclosed in, e.g., U.S. Pat. No. 5,181,610 entitled "Flexible Container with Nonstick Interior" which issued to Quick et al. on Jan. 26, 1993.

The flap adhesive cover **81** can be of any suitable size and shape, though the figures depict a flap adhesive cover **81** which is only of sufficient width and length to cover and protect the flap adhesives **76**.

The wrapper **78** preferably also may include an optional package fastener **86** for retaining the package formed by folding the wrapper and sanitary napkin in its folded configuration. The package fastener **86** is preferably both releasably attachable to the package and resealable. The package fastener **86** may be formed by any releasably attachable and resealable fastener known in the art, such as spots or patches of adhesive, tapes, and mechanical fasteners. A package fastener with a pressure sensitive adhesive located thereon has been found to work well. The package fastener **86** can be disposed at any suitable location on the wrapper **78**. In the embodiment shown in FIG. 1, the package fastener **86** is preferably positioned at opposing first end portion **80A** of the main wrapper sheet **80**.

FIGS. 9–11 show one example of a process for packaging the sanitary napkin **20** in the wrapper **78**. In this embodiment, the flap adhesive cover **81** is provided and is a separate flap adhesive cover sheet. The main adhesive cover **82** is a separate single sheet. Prior to packaging the sanitary napkin **20** in the wrapper **78**, the first flaps **24** are folded onto the topsheet **38** (i.e., body surface **20A**). Folding the flaps **24** in the configuration shown in FIG. 6 exposes the patches of adhesive **76** disposed on the garment surface **20B** of flaps **24** and causes the flaps **24** to cover at least a portion of the topsheet **38**. The folded left and right flaps **24** are

connected to each other by the flap adhesive cover **81**. The flap adhesive cover **81** covers the flap adhesives **76** (not shown in FIGS. 9–11) and maintains the flaps **24** in position folded over the topsheet **38**. The adhesive layer **90** is provided on the opposite side **81B** of the flap adhesive cover **81**. As shown in FIGS. 9 and 10, the sanitary napkin **20** is placed on top of the main wrapper sheet **80** (i.e., the inner surface **80E**) such that the opposite side **81B** of the flap adhesive cover **81** faces the inner surface **80E** of the main wrapper sheet **80**. Thereby the flap adhesive cover **81** is joined to the main wrapper sheet **80** by the adhesive layer **90**. The body surface **20A** faces the inner surface **80E** of the main wrapper sheet **80**. Disposing the body surface **20A** of the sanitary napkin **20** facing the main wrapper sheet **80** can be considered to provide protection to prevent the topsheet **38** from becoming soiled prior to use. Alternatively, the flap adhesive cover **81** may be joined to the inner surface **80E** of the main wrapper sheet **80** before the flap adhesive cover **81** is releasably affixed to the flap adhesives **76**. In this case, the sanitary napkin **20** is placed on top of the main wrapper sheet **80** such that the flap adhesives **76** lies over the flap adhesive cover **81** on the main wrapper sheet **80**.

The main body adhesive **74** on the garment surface **20B** is covered by the main adhesive cover **82** as shown in FIG. 10. As shown, in the configuration where the main adhesive cover **82** has not yet been joined to the main wrapper sheet **80**, the fixed end portion **80A** of the main adhesive cover **82** is located proximate to the first end portion **80A** of the main wrapper sheet **80**. The free end portion **82D** is located proximate to the second end portion **80B** of the main wrapper sheet **80**. The fixed end portion **82C** is located in the third region **43** and the free end portion **82D** is located in the second region **41**. The main adhesive cover **82** may be releasably affixed to the main body adhesive **74** before or after the sanitary napkin **20** is placed on the main wrapper sheet **80**. The adhesive layer **91** is provided on the opposite side **82B** of the main adhesive cover **82** proximate to the first end portion **82C** of the main adhesive cover **82**. The adhesive layer **91** may be applied thereto anytime before the sanitary napkin **20** and the wrapper **78** are folded as a unit.

After disposing the sanitary napkin **20** on the main wrapper sheet **80** as shown in FIG. 10, the sanitary napkin **20** will then preferably be folded as a unit, together with the wrapper **78** including the main wrapper sheet **80**, the flap adhesive cover **81**, and the main adhesive cover **82**, into three regions that are defined by the fold axes **F1** and **F2**. The fold axes **F1** and **F2** will divide both the sanitary napkin **20** and the wrapper **78** into three regions including the first region **39**, the second region **41** and the third region **43**. As shown in FIG. 10, the central region (the first region) **39** lies between preferred fold axes **F1** and **F2**. The second and third regions **41** and **43** lie longitudinally outboard of the fold axes **F1** and **F2**. As described above, the main body portion **22** is also separated at the fold axes **F1** and **F2** into three sections including the first section **36**, the second section **34**, and the third section **32**. Each section **36**, **34** and **32** generally extends in each region **39**, **41** and **43** respectively (refer to FIG. 1 as well). As shown in FIG. 10, the sanitary napkin **20** and the wrapper **78** of the second region **41** is folded as a unit toward the sanitary napkin **20** of the first region **39** such that the garment surface **20B** of the sanitary napkin **20** is oriented inwardly with respect to the folded unit and the main wrapper sheet **80** is oriented outwardly with respect to the folded unit (refer to FIG. 11 as well). Then, the sanitary napkin **20** and the wrapper **78** of the third region **43** is folded onto the wrapper **78** (i.e., the main wrapper sheet **80**) of the second region **41** such that the garment surface **20B** of the

third region **43** faces the outer surface **80F** of the main wrapper sheet **80**. Because of the adhesive layer **91** disposed on the main adhesive cover **82**, the fixed end portion **82C** of the main adhesive cover **82** joins to the outer surface **80F** proximate to the second end portion **80B** of the main wrapper sheet **80** as shown in FIG. **12**. In the folded configuration, the body surface **20A** of the sanitary napkin **20** is covered by the main wrapper sheet **80**. In addition, the garment surface **20B** is oriented inwardly with respect to the folded unit of the sanitary napkin **20** and the wrapper **78**. Preferably, in the folded configuration, the sanitary napkin **20** is fully wrapped by the main wrapper sheet **80** and is not exposed outside the main wrapper sheet **80** (i.e., neither the body surface **20A** and the garment surface **20B** are exposed outside the main wrapper sheet **80**). Alternatively, the sanitary napkin **20** may be folded together with the wrapper **78** into two regions that are divided by one fold axis. In such a case, the sanitary napkin **20** and the wrapper **78** are folded about the axis such that a part of the sanitary napkin **20** in one region faces a part of the sanitary napkin **20** in the other region. In this configuration, the garment surface of the sanitary napkin **20** is oriented inwardly to the folded unit of the sanitary napkin and the wrapper. Preferably, to complete the individual packaging of the sanitary napkin **20** in the wrapper **78**, each longitudinal side portion **80D** of the main wrapper sheet **80** is then frangibly sealed as shown in FIG. **13** after the sanitary napkin **20** and the wrapper **78** are in the folded configuration. The frangible sealing of the longitudinal side portions **80D** of the main wrapper sheet **80** can be accomplished by any suitable sealing technique. By way of example only, the longitudinal side portions **80D** may be heat sealed, glued, or ultrasonically bonded. The entire sanitary napkin **20** is thereby protected until the main wrapper sheet **80** is opened. Suitable methods for frangibly sealing the longitudinal side portions are described in, e.g., U.S. Pat. No. 4,556,146 issued to Swanson. FIG. **13** depicts the package for the sanitary napkin formed by folding the wrapper **78** and sanitary napkin **20** in one preferred configuration for shipment, sale, and convenient carrying by the wearer.

The wearer will ordinarily carry the individually packaged sanitary napkin in the form depicted in FIG. **13**. The individually packaged sanitary napkin may be opened by peeling the package fastener **86** from the wrapper **78** and breaking the frangible seals along the longitudinal side portions **80D** of the main wrapper sheet **80** such that the sanitary napkin **20** of the third region **43** is opened from the main wrapper sheet **80** of the second region **41** as shown in FIG. **14**. Because the fixed end portion **82C** is joined to the outer surface **80F** of the main wrapper sheet **80**, the fixed end portion **82C** remains with the main wrapper sheet **80**. Thereby a part of the main body adhesive **74** located in the third region **43** is automatically exposed coincidentally as the third region **43** is opened from the second region **41**. Then the second region **41** is opened from the first region **39** in order to further expose the main body adhesive **74** located in the first region **39** as shown in FIG. **15**. Thus, by opening the wrapped sanitary napkin, at least a part of the main body adhesive **74** is exposed so that it will be able to attach to the crotch region of the undergarment, while the body surface **20A** (not shown in FIG. **15**) of the sanitary napkin **20** is still covered by the main wrapper sheet **80** to protect it from contamination. As shown in FIG. **16**, the sanitary napkin **20**, whose body surface **20A** (not shown) is covered by the main wrapper sheet **80**, is placed on the crotch portion **100** of the undergarment **102** such that the main adhesive **74** (now exposed) faces the inside of the crotch region **100**. This can

be done without touching the body surface **20A** (which will subsequently directly touch the wearer's body during use) because the body surface **20A** is still covered by the main wrapper sheet **80**. In addition, the first flap adhesive **76** does not inadvertently stick to the hands of the wearer or a portion of the sanitary napkin **20** because the first flap adhesive **76** is covered by the main wrapper sheet **80**. In this embodiment, during application process of the sanitary napkin **20** to the undergarment **102**, the main wrapper sheet **80** does not easily detach from the sanitary napkin **20** because the main wrapper sheet **80** and the sanitary napkin **20** are affixed to each other by means of the flap adhesive **76**. Although the main wrapper sheet **80** is releasably affixed to the sanitary napkin **20**, it can be controlled such that the main wrapper sheet **80** does not easily detach from the sanitary napkin **20** during application process of the sanitary napkin **20** to the undergarment. The configuration (how large the flap fasteners are) and/or adhering strength of the flap adhesive **76** may be independently chosen to control it. Adjustment of the configuration (e.g., bigger area of adhesive) and/or adhering strength (e.g., higher average adhering strength of adhesive) has no impact to wearer's skin comfortableness during the use of the sanitary napkin **20**. As the configuration of the flap adhesive **76** becomes bigger and/or adhering strength becomes higher, the main wrapper sheet **80** becomes tends not to detach from the absorbent article. Further, in this embodiment, because the flap adhesive **76** is utilized to releasably affix the main wrapper sheet **80** to the sanitary napkin **20**, no additional means to affix the main wrapper sheet **80** and the sanitary napkin **20**, such as adhesives provided on the topsheet which may cause skin problem or cause the wearer to feel stickiness, is necessary. Because the body surface **20A** (not shown in FIG. **16**) is covered by the main wrapper sheet **80**, the body surface **20A** is protected from contamination during the application process of the sanitary napkin to the undergarment. Therefore, the wearer may push the side of the main wrapper sheet **80** toward the undergarment **102** to secure the main adhesive **74** to the crotch portion **100**. Then the wearer pulls the package fastener **86** to remove the main wrapper sheet **80** from the sanitary napkin **20** which is secured to the crotch portion **100** of the undergarment **102**. As shown in FIG. **17**, as the main wrapper sheet **80** is removed, the flap adhesive cover **81** which is joined to the inner surface **80E** of the main wrapper sheet **80** is removed from the flap adhesive **76**. The wearer further pulls the main wrapper sheet **80** to remove the main wrapper sheet **80** from the sanitary napkin **20** as shown in FIG. **18**. Because the fixed end portion **82C** of the main adhesive cover **82** is joined to the outer surface **80F** of the main wrapper sheet **80** proximate to the second end portion **80B** of the second region **41**, the wearer is able to peel the main adhesive cover **82** together with the main wrapper sheet **80** from the main body adhesive **74** without feeling shear force therebetween. Thus, after placing the sanitary napkin **20** with the main wrapper sheet **80** against the crotch region **100** (FIG. **16**), removal of the main wrapper sheet **80** and the main adhesive cover **82** can be done in a single motion of pulling a part of main wrapper sheet **80**. After the completion of removal, the wearer flips over the flap **24** toward the outside surface of the undergarment. Once the sanitary napkin is removed from the wrapper **78** and installed in the wearer's undergarment, the wearer may fold the wrapper **78**, secure the wrapper **78** in its folded orientation by reattaching resealable package fastener **86** to wrapper **78**. The wearer may then store the folded wrapper **78** for rewrapping and disposing of the used sanitary napkin. The wearer need not worry about collecting and

disposing of loose flap adhesive cover **81** and main adhesive cover **82** since the flap adhesive cover **81** and the main adhesive cover **82** are joined to the main wrapper sheet **80**. Therefore, the present invention provides the wearer with a clean sanitary napkin **20** which is easily installed while keeping the body surface hygienic and without extra pieces of waste which must be collected.

Various alternative embodiments of the present invention are possible. For example in the embodiment explained above, instead of having the flaps **24**, the sanitary napkin **20** could be formed by only the main body portion without the flaps **24**. In such a case, a releasable joint means may be provided between the body surface **20A** of the sanitary napkin **20** and the main wrapper sheet **80**. Such releasable joint means may be formed by any suitable means. Preferably, the joint means is formed by a means which does not have a negative impact to the wearer's skin, but has adhering strength sufficient to affix the main wrapper sheet **80** to the body surface **20A** such that the main wrapper sheet **80** does not detach from the main body portion **22** even during application process of the sanitary napkin **20**. If the main wrapper sheet **80** and the body surface **20A** (i.e., topsheet **38**) are formed by a thermoplastic material, they may be fused to each other at one or more small spots. However, the number of the fused spots and the area of the fused spots are preferably chosen not to give the wearer stiffness feeling due to the fused area while the main wrapper sheet **80** is readily released from the body surface **20A**. Although it is less preferred, adhesive may be used to join the main wrapper sheet **80** and the body surface **20A**. The sanitary napkin **20** may have another additional pair of flaps. The additional flaps extend laterally outward beyond the longitudinal side edges **26** of the main body portion **22**. The additional flaps are positioned proximate to one end edge **28** of the main body portion **22** and apart from the flaps **24** in the longitudinal direction of the main body portion **22**. The additional flaps preferably each have additional fasteners thereon, such as a pressure sensitive adhesive fastener, for releasably affixing the additional flaps of the sanitary napkin **20** in a configuration staying widespread in a back region of the inside of a wearer's undergarment. The additional flap adhesives are used to assist in maintaining the additional flaps in position after they are rendered widespread in a back region of the inside of the panty. In order to cover the additional flap adhesive, an additional flap adhesive cover may be provided. The additional flap adhesive cover may be formed by the same material/shape as the flap adhesive cover **81** of the flap adhesive **76** and is joined to the inner surface **80E** of the main wrapper sheet.

It is to be recognized that the foregoing detailed description of the preferred embodiment of the present invention is given merely by way of illustration, and that numerous modifications and variations may become apparent to those skilled in the art without departing from the spirit and scope of the invention. Therefore, the scope of the present invention is to be determined by reference to the appended claims.

What is claimed is:

1. An individually packaged absorbent article comprising:

- (a) an absorbent article extending in a longitudinal direction and including a main body portion having a pair of longitudinal side edges, a pair of end edges, a garment surface, and a body surface, wherein the garment surface of the main body portion has a main fastener,
- (b) a wrapper for the absorbent article, the wrapper having a main wrapper sheet and a main fastener cover, wherein

(c) the body surface of the main body portion is disposed to face the main wrapper sheet, and the main fastener of the main body portion is covered by the main fastener cover, wherein the main fastener cover is joined to the main wrapper sheet, and

(d) the main body portion and the wrapper are folded as a unit at least about one transverse axis such that the garment surface is oriented inwardly with respect to the folded unit, wherein at least a part of the main fastener is exposed when the wrapper is opened.

2. The absorbent article of claim **1** wherein:

the main wrapper sheet has a pair of longitudinal side portions, a first end portion, and a second end portion, the main fastener cover has a pair of longitudinal side portions, a fixed end portion, and a free end portion, the fixed end portion located proximate to the second end portion of the main wrapper sheet in the folded configuration, wherein

the fixed end portion is joined to the second end portion of the main wrapper sheet.

3. The absorbent article of claim **2** wherein:

the main body portion and the wrapper have two transverse axes and three regions,

wherein the two axes have a first axis and a second axis, and the three regions have a first region, a second region, and a third region, wherein the first region and the second region are separated by the first axis, and the first region and the third region are separated by the second axis, wherein the main body portion and the wrapper are folded along the first axis such that the main body portion of the second region superposes on the main body portion of the first region, and folded along the second axis such that the main body portion of the third region superposes on the main wrapper sheet of the second region.

4. The absorbent article of claim **3** wherein the fixed end portion of the main fastener cover is joined to the second end portion of the main wrapper sheet of the second region.

5. The absorbent article of claim **4** wherein the main fastener cover extends at least in a part of the third region, wherein the fixed end portion of the main fastener cover is joined to the second end portion of the main wrapper sheet of the second region.

6. The absorbent article of claim **5** wherein the main fastener cover extends along the first region, the second region, and the third region.

7. The absorbent article of claim **1** wherein the main fastener cover is formed by a separate element from the main wrapper sheet.

8. The absorbent article of claim **1** wherein the absorbent article has a pair of flaps joined to the main body portion and extending laterally outward beyond the longitudinal side edges of the main body portion, the garment surface of the flap has a flap fastener.

9. The absorbent article of claim **8** wherein the flaps are folded over the body surface of the main body portion to expose the flap fasteners, wherein the flap fastener is releasably affixed to the main wrapper sheet.

10. The absorbent article of claim **9** wherein the wrapper includes a flap fastener cover provided on the main wrapper sheet, wherein the flap fastener is releasably affixed to the flap fastener cover.